Atop ABLELink® Serial-Ethernet Server GW21W

User Manual

Version 2.3

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Important Announcement

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FCC WARNING

Class B for Serial-Ethernet Server (Model GW21W)

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and radiates radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expenses.

A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord can be used.

Use only shielded cables to connect other devices to this equipment by RS-232 / RS-485 ports.

Be cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

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1. Introduction

The Atop GW21W Serial-Ethernet Server is a gateway between Ethernet (TCP/IP) and RS-232/RS-485 communications. The information transmitted by GW21W is transparent to both host computers (Ethernet) and devices (RS-232/RS-485). Data coming from the Ethernet (TCP/IP) is sent to the designated RS-232/RS-485 port and data being received from RS-232/RS-485 port is sent to the Ethernet (TCP/IP) transparently.

In the computer integration manufacturing or industrial automation area, the Atop GW21W Serial-Ethernet Server is used for field devices to direct connect to Ethernet network. Terminal Server (main control program run in GW21W) transforms whatever data received from RS-232/RS-485 to TCP/UDP port then connect devices to the Ethernet network via a single application program or multiple application programs.

Many control devices provide the ability to communicate with hosts through RS-232/RS-485 however RS-232/RS-485 serial communication has its limitations. For one, it is hard to transfer data through a long distance. With Atop GW21W, it is possible to communicate with a remote device in the Intranet environment or even in the Internet and thus, increases the communication distance dramatically.

GW21W from Atop Technologies Inc. offers two RS-232/ RS-485 ports, one wireless Ethernet (IEEE802.11b, 11Mbps) and Watch-Dog Timer etc.

1.1 Packaging

Atop Serial-Ethernet Server x 1

Atop Serial-Ethernet Server quick start guide x 1

Power adapter (AC 110V or 230V to DC 12V) x 1

Product CD containing configuration utility and sample programs x 1

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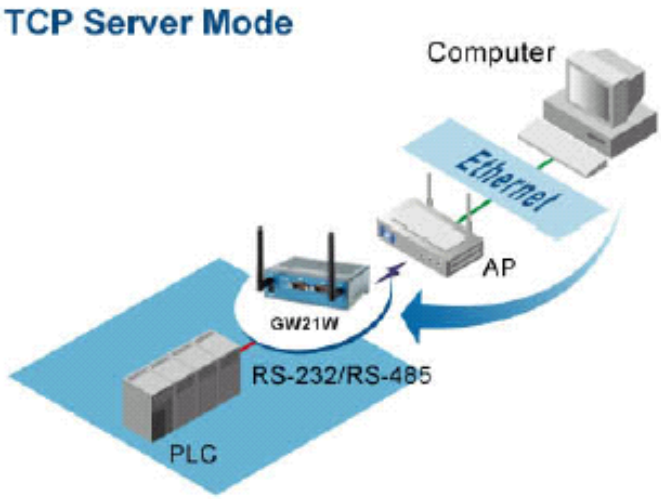
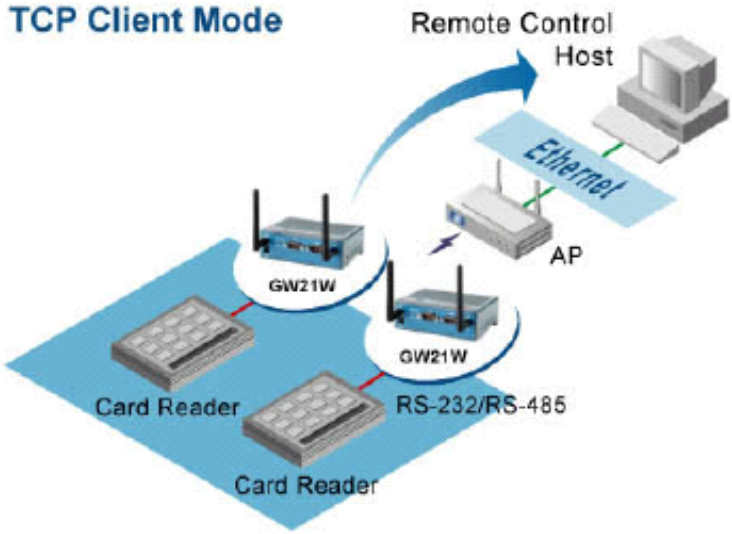
1. 2 Application Connectivity





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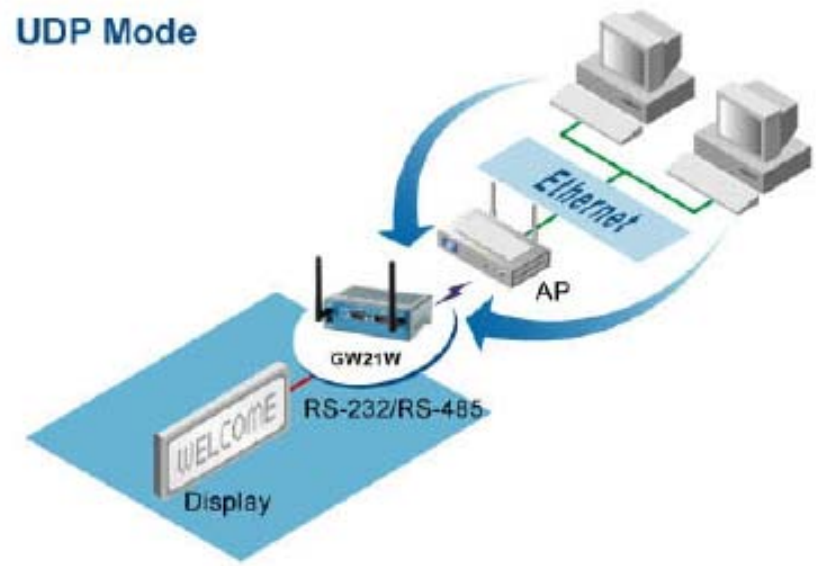

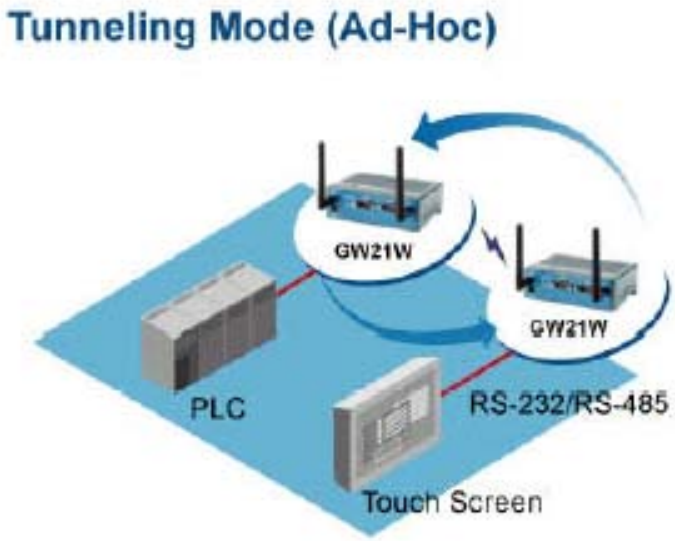

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2. Hardware Installation

- Prepare necessary cables, hub, power cord and RS232/RS485 connector.
- Place GW21W in the access point covered area.
- Connect a serial device to a serial port of GW21W, make sure the right connection of either RS-232 or RS-485.
- Plug in DC-12V, the buzzer will beep and LED will blink if GW21W functions normally. Please refer to Appendix A.4 to see all of LED messages.
- Use monitor.exe configuration utility in the product CD or diskette to diagnose GW21W. If it starts up successfully, you are able to find the IP and MAC addresses of GW21W. You can change the network parameters of GW21W to join your LAN by changing its IP address, gateway IP address and subnet mask.

Note: If there are more than one access points, the access point's ESSID must be the same.

2.1 Configuration

Atop GW21W Serial-Ethernet Server is shipped with default settings shown in the following table:

Property	Default Value
IP Address	10.0.50.100
Gateway	10.0.0.254
Subnet Mask	255.255.0.0
User Name	Admin
Password	Null
COM 1	9600, None, 8, 1, No flow control, buffer disabled, packet delimiter timer 2ms
COM 2	9600, None, 8, 1, No flow control, buffer disabled, packet delimiter timer 2ms
Link 1	Type: TCP Server, Listen port 4660 Filter=0.0.0.0
Link 2	Type: TCP Server, Listen port 4661 Filter=0.0.0.0
SysName of SNMP	Name
Syslocation of SNMP	Location
SysContact of SNMP	Contact

NOTE: Atop provides a reset button to restore system settings including IP address, gateway IP address and subnet mask etc. to the defaults. Press and hold the reset button for 5 seconds till the server reboots.

2.2 Assigning a new IP Address by ARP command

The following example uses ARP to assign a static IP address of GW21W using its MAC address. GW21W MAC address is printed on the label of the rear panel.

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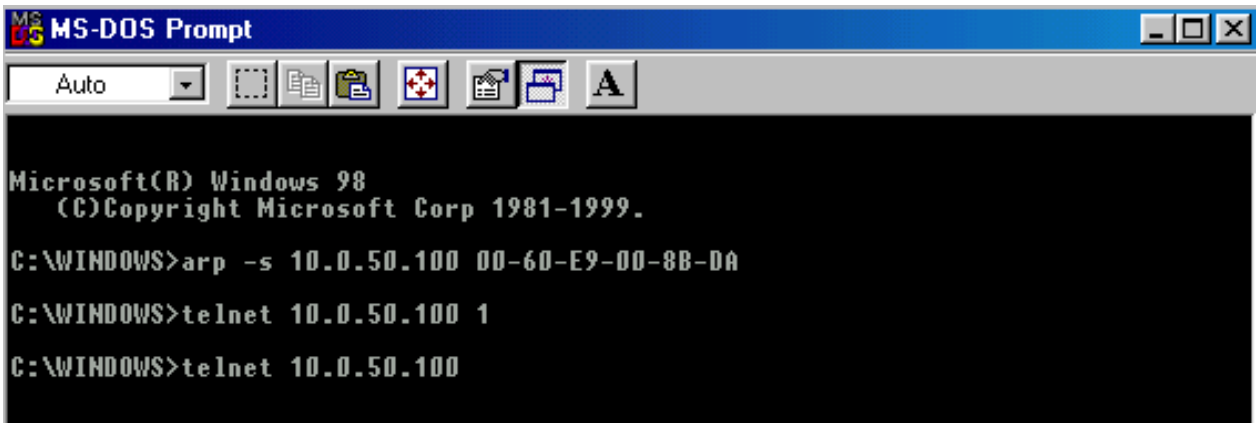
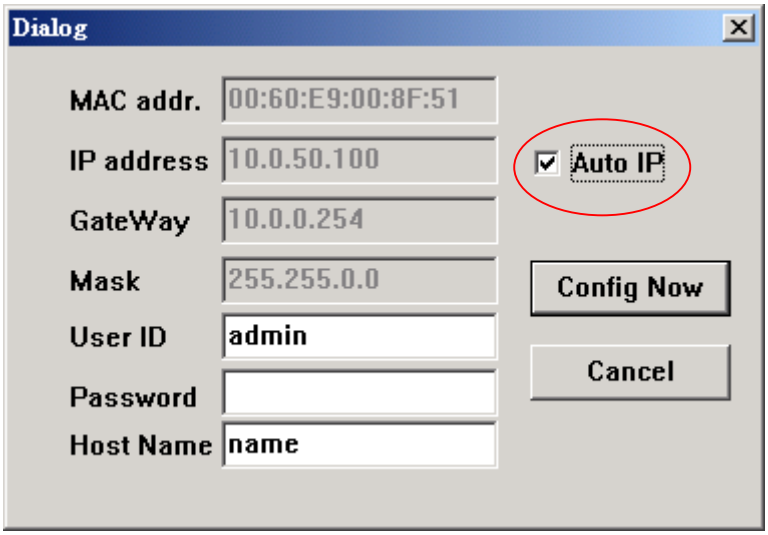


2.3 Auto IP

A DHCP server automatically assigns the IP address and network settings. GW21W supports DHCP. It will supply for the unit with an IP address gateway address, and subnet mask. You may use **Monitor.exe** software to search network information automatically by putting a check on **Auto IP** on Dialog window.



2.4 TCP/IP Port Number

Port number 4660 and 4661 are defaults of GW21W and are associated with serial ports COM1 and COM2 respectively. After your application program connects to the TCP port 4660 (or 4661) of GW21W, data being sent to this TCP connection from your application program are transparent to the COM1 (or COM2) of GW21W. Vice versa is also true.

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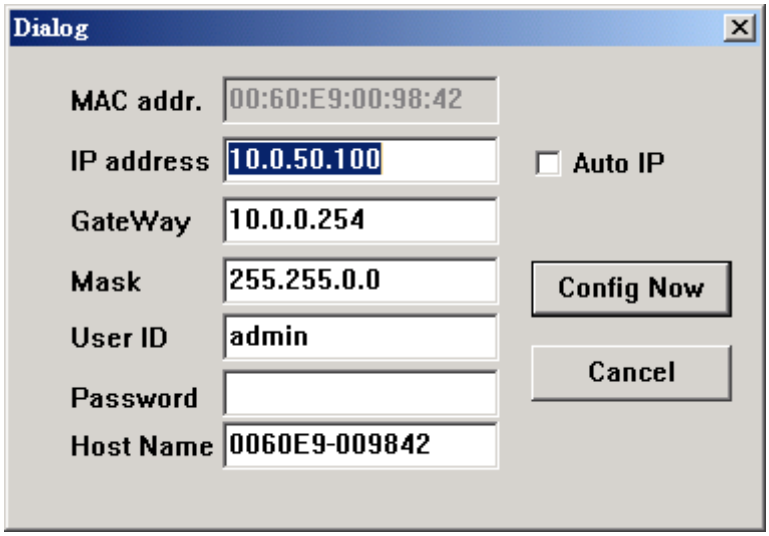
3. Software Configuration

3.1 Configuration set by monitor.exe utility

Use **monitor.exe** that comes with the product CD or diskette to configure the network parameters of GW21W. As you can see from the following picture, you can change IP address, gateway IP address, subnet mask, user ID and password of GW21W from the utility. For more details of the utility please refer to Appendix-D Configuration Utility.



3.2 Configuration set by Telnet

You can use Telnet utility to change configuration settings of GW21W. To do so, please do the following.

Log in to the system

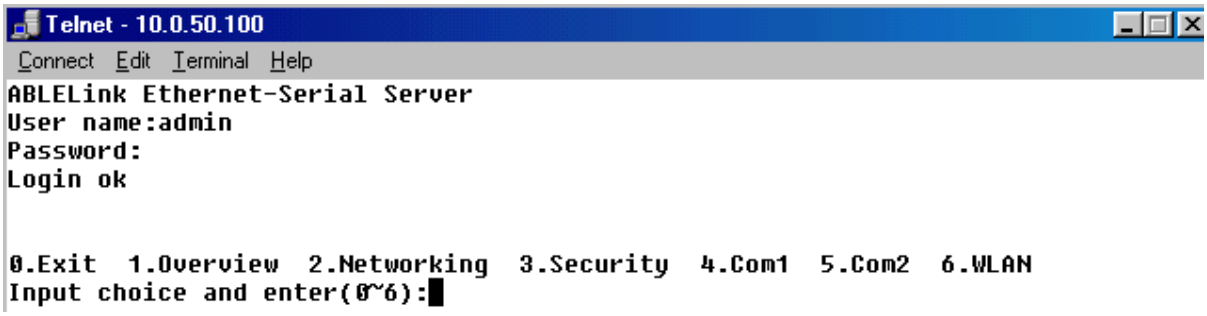
1. Telnet to GW21W using command “Telnet IP_address”.

   For example Telnet 10.0.50.100

2. After Telnet to GW21W, system prompts for a password, the default password is null.

   Note: You can press the reset button of GW21W to reset the password to the default value.

3. After verifying the password, the following terminal screen appears.



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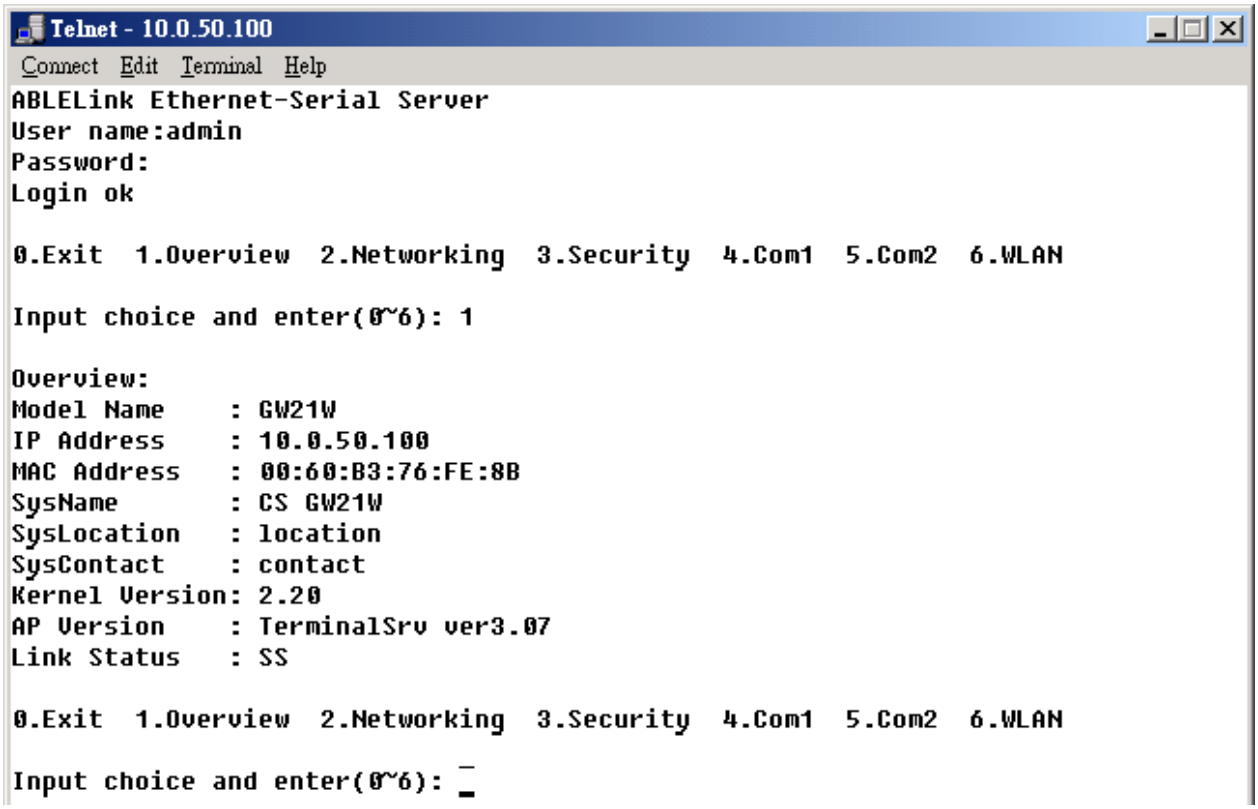
Notes:

1. If GW21W does not receive any command within 1 minute, Telnet will be terminated automatically.
2. The changes of networking parameters will take effect only when you exit and restart GW21W.
3. Select “1” from “Input choice and enter (0~6):” to enter overview page as following:



This page gives you the general information of GW21W including IP and MAC address, SNMP information, kernel and AP version, and connection status of the device.

Networking

Select “2” from “Input choice and enter (0~6):” to enter Networking page as following:

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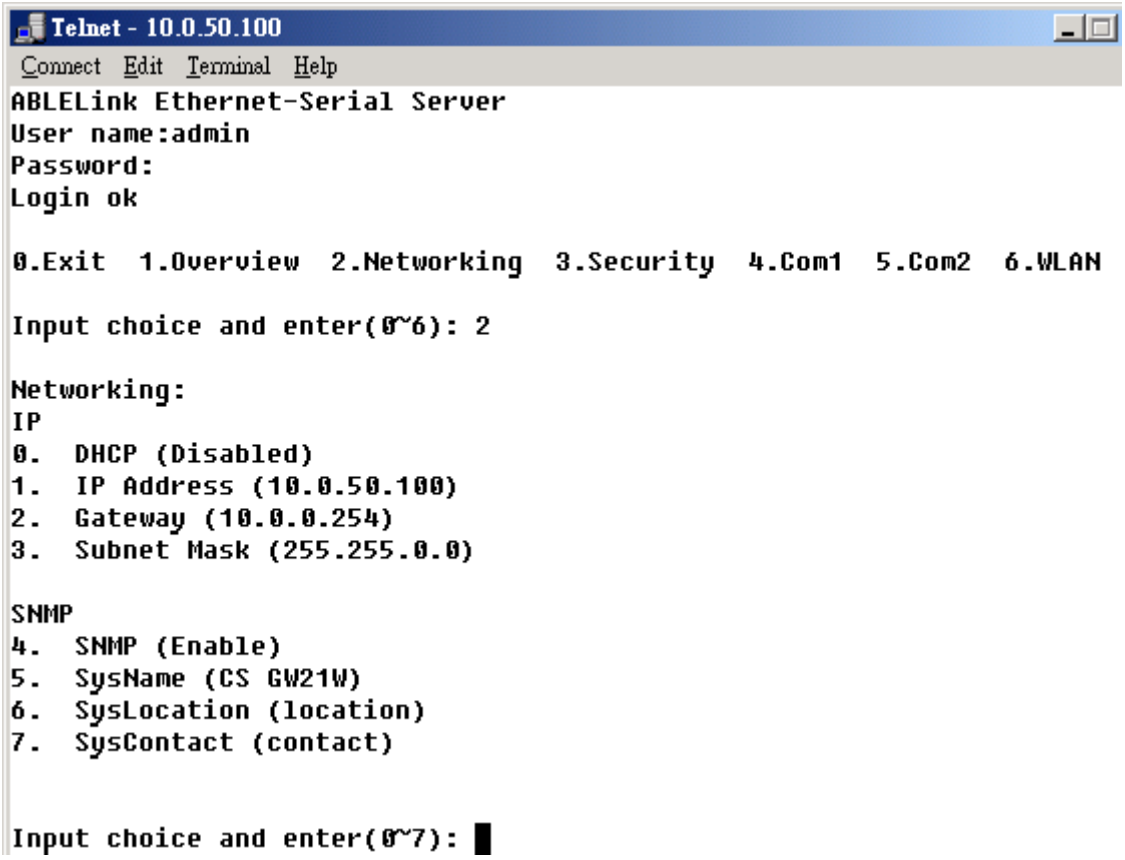
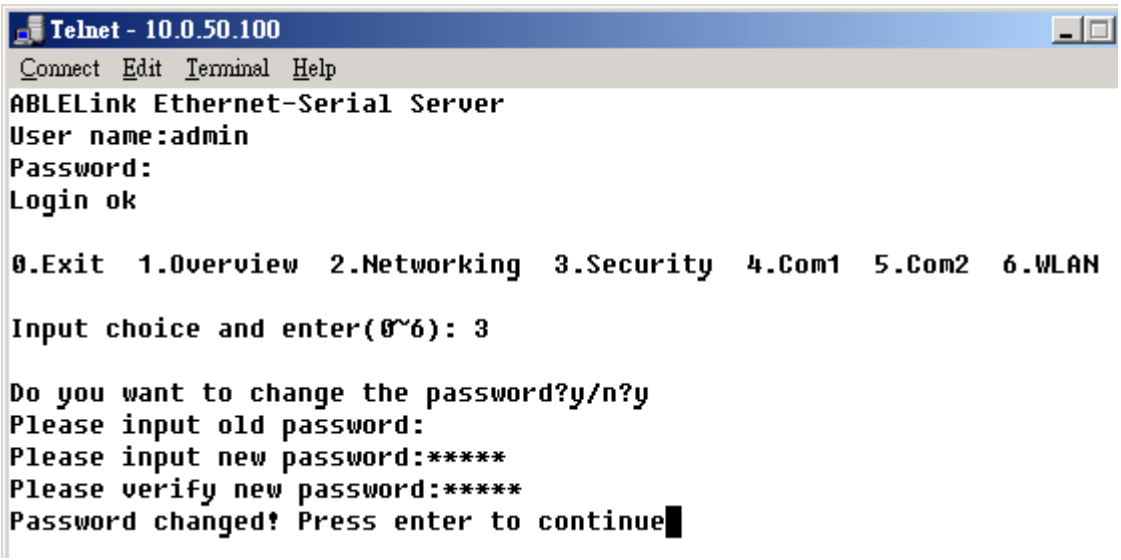


This page allows you to change network settings of the device including IP address, subnet mask, gateway IP address and SNMP information of GW21W. Please notice that any setting change made on this page will not take effect until you restart the device.

Change the password

1. Select “3” from “Input choice and enter (0~6):” the following screen appears.


Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:
Login ok
0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.Com2 6.WLAN
Input choice and enter(0~6): 3
Do you want to change the password?y/n?y
Please input old password:
Please input new password:*****
Please verify new password:*****
Password changed! Press enter to continue

2. If you want to change the password, please type the old password in the “Please input old password” field, type the new password in the “Please input new password” and the “Please verify new password” fields.

Note: You can press the reset key of product to reset password to the default value.

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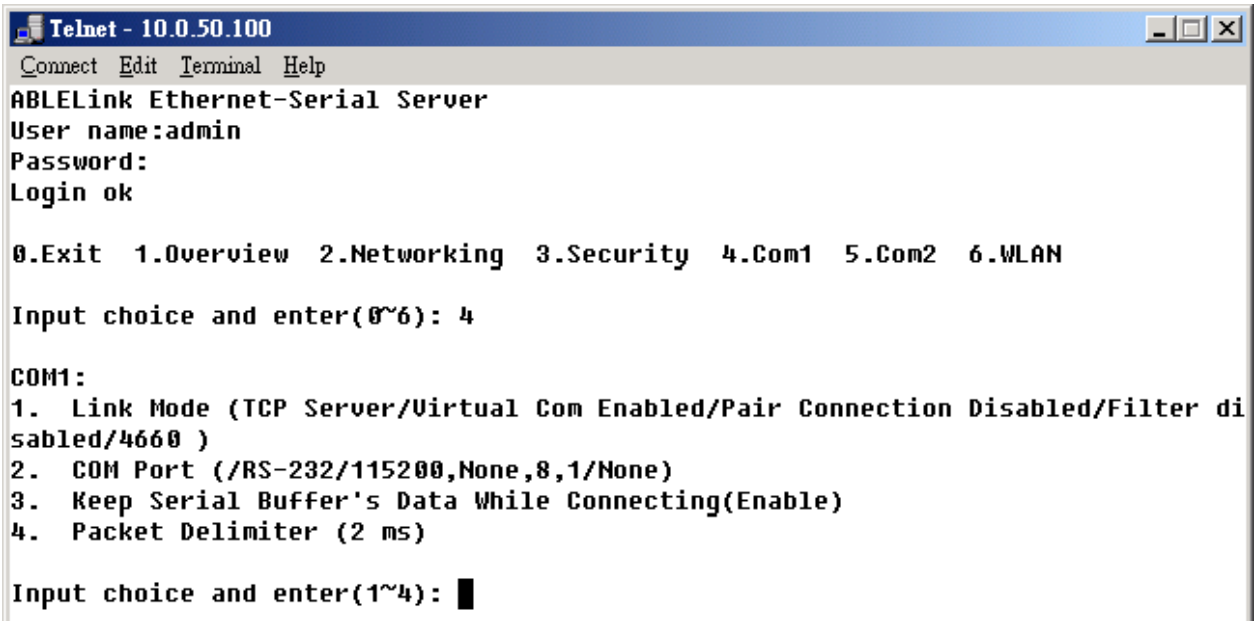
COM1 Setup

Select “4” from “Input choice and enter (0~6):” the following screen appears


Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:
Login ok
0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.Com2 6.WLAN
Input choice and enter(0~6): 4
COM1:
1. Link Mode (TCP Server/Virtual Com Enabled/Pair Connection Disabled/Filter disabled/4660)
2. COM Port (/RS-232/115200,None,8,1/None)
3. Keep Serial Buffer's Data While Connecting(Enable)
4. Packet Delimiter (2 ms)
Input choice and enter(1~4):

The page gives you the opportunity to configure parameters of COM1 setting which include COM1 working mode, port parameters, enabling or disabling serial buffer’s data and setting packet delimiter.

LINK1 Setup

Type 1 from “Input choice and enter (1~4):” of COM1, the following screen appears. Configure GW21W as TCP server and the local port is 4660. IP filter is disabled by default, if IP filter is enabled, only source IP 10.0.0.154 can connect to GW21W.

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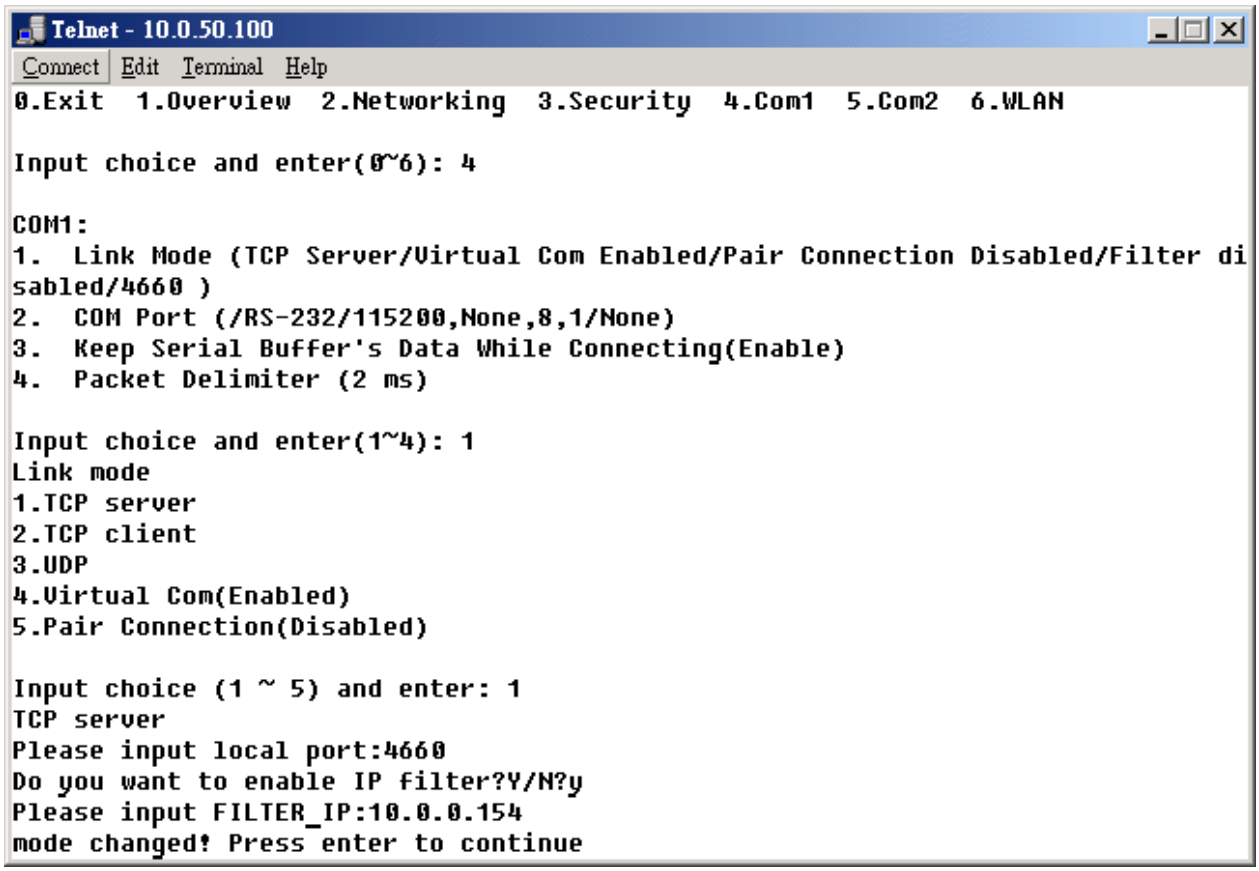
Telnet - 10.0.50.100
Connect Edit Terminal Help
0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.Com2 6.WLAN
Input choice and enter(0~6): 4
COM1:
1. Link Mode (TCP Server/Virtual Com Enabled/Pair Connection Disabled/Filter disabled/4660)
2. COM Port (/RS-232/115200,None,8,1/None)
3. Keep Serial Buffer's Data While Connecting(Enable)
4. Packet Delimiter (2 ms)
Input choice and enter(1~4): 1
Link mode
1.TCP server
2.TCP client
3.UDP
4.Virtual Com(Enabled)
5.Pair Connection(Disabled)
Input choice (1 ~ 5) and enter: 1
TCP server
Please input local port:4660
Do you want to enable IP filter?Y/N?y
Please input FILTER_IP:10.0.0.154
mode changed! Press enter to continue

Note: IP filtering function is disabled if setting FILTER_IP to “0.0.0.0”.

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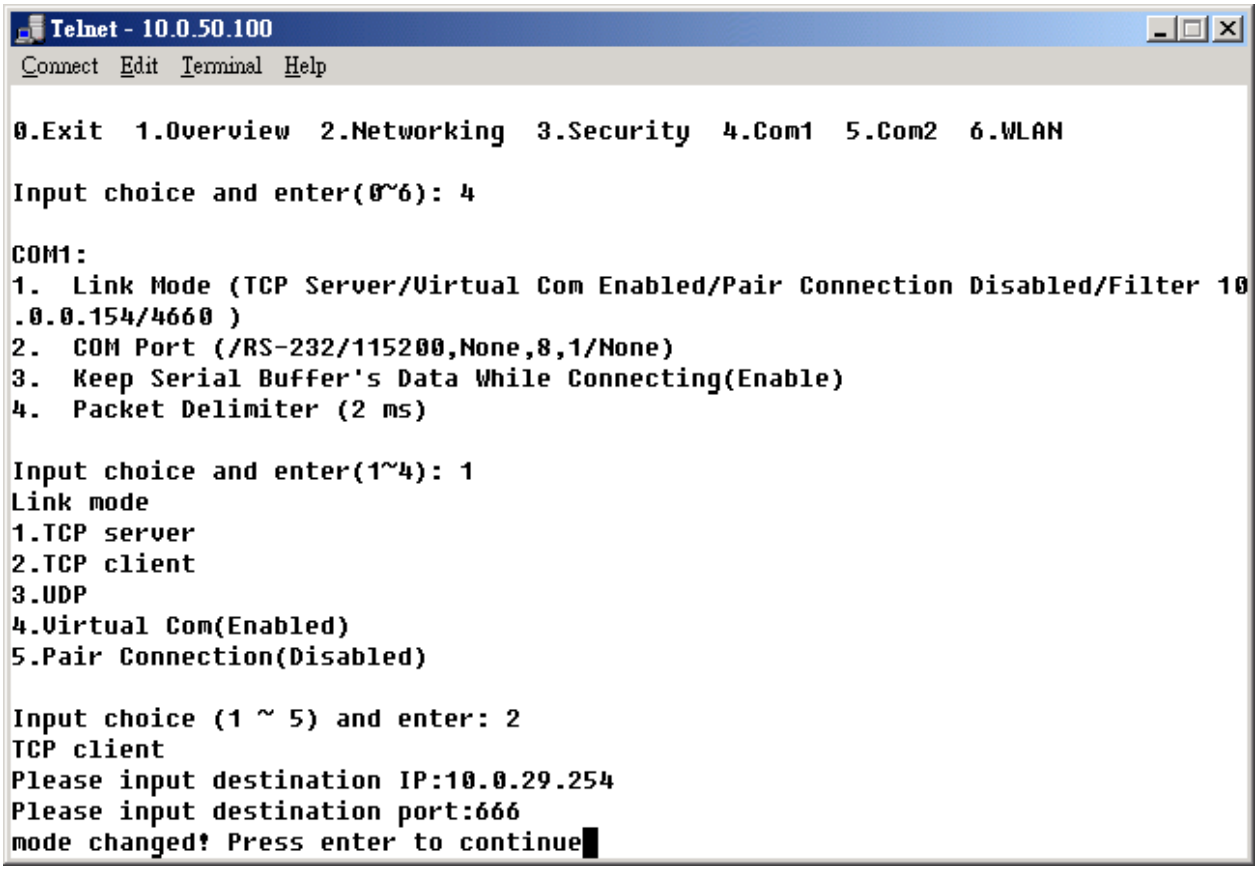
Configure GW21W as TCP client, the destination IP is 10.0.29.254, destination port is 666 for example.


Telnet - 10.0.50.100
Connect Edit Terminal Help
0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.Com2 6.WLAN
Input choice and enter(0~6): 4
COM1:
1. Link Mode (TCP Server/Virtual Com Enabled/Pair Connection Disabled/Filter 10
.0.0.154/4660)
2. COM Port (/RS-232/115200,None,8,1/None)
3. Keep Serial Buffer's Data While Connecting(Enable)
4. Packet Delimiter (2 ms)
Input choice and enter(1~4): 1
Link mode
1.TCP server
2.TCP client
3.UDP
4.Virtual Com(Enabled)
5.Pair Connection(Disabled)
Input choice (1 ~ 5) and enter: 2
TCP client
Please input destination IP:10.0.29.254
Please input destination port:666
mode changed! Press enter to continue

Configure GW21W as UDP client, the local port is 4660, the destination IP is 10.0.29.254, destination port is 666 for example.

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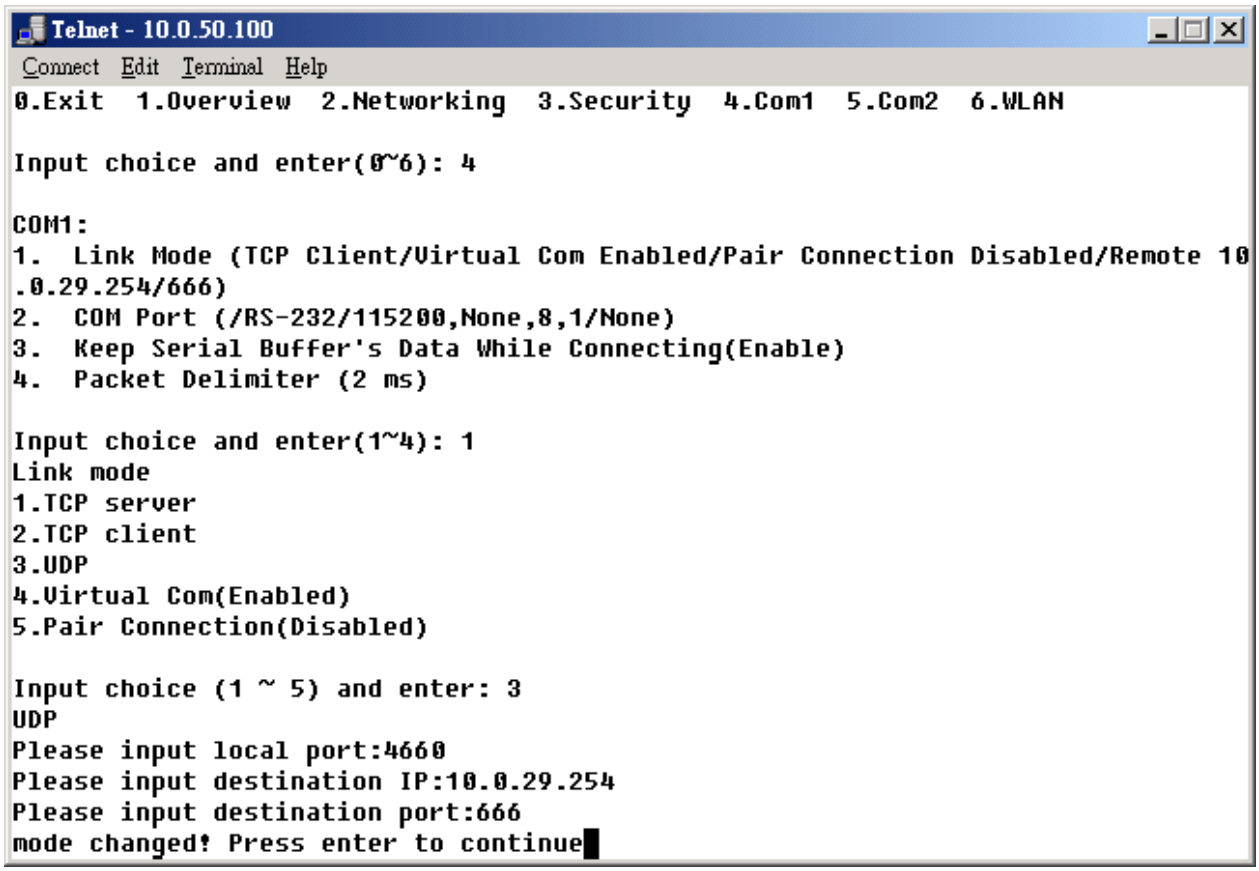

COM port setting

Type 2 from “Input choice and enter (1~4):” of COM1, the following screen appears, you can then give the COM port alias name, set the baud rate and parity, determine number of data bit and stop bit, and decide if you want to use flow control and the type of flow control you want to use.

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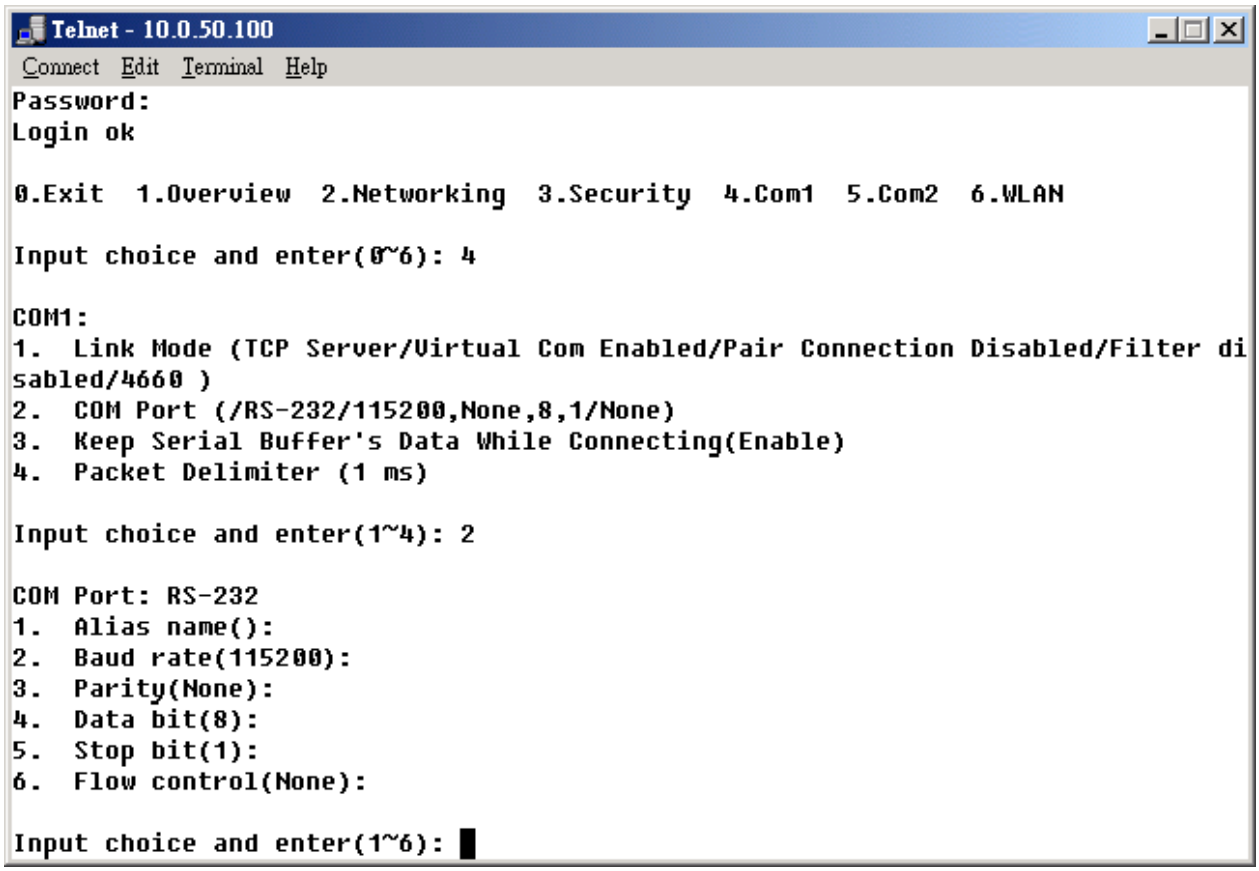
Telnet - 10.0.50.100
Connect Edit Terminal Help
Password:
Login ok
0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.Com2 6.WLAN
Input choice and enter(0~6): 4
COM1:
1. Link Mode (TCP Server/Virtual Com Enabled/Pair Connection Disabled/Filter disabled/4660)
2. COM Port (/RS-232/115200,None,8,1/None)
3. Keep Serial Buffer's Data While Connecting(Enable)
4. Packet Delimiter (1 ms)
Input choice and enter(1~4): 2
COM Port: RS-232
1. Alias name():
2. Baud rate(115200):
3. Parity(None):
4. Data bit(8):
5. Stop bit(1):
6. Flow control(None):
Input choice and enter(1~6):

Enabling serial data buffer

Type 3 from “Input choice and enter (1~4):” of COM1, by default COM port serial data buffer is enabled meaning that when TCP/IP Ethernet connection is broken, serial data collected from serial device will be kept in GW21W, once TCP/IP connection is resumed, the serial data will be sent through Ethernet connection, you can disable it if you wish.

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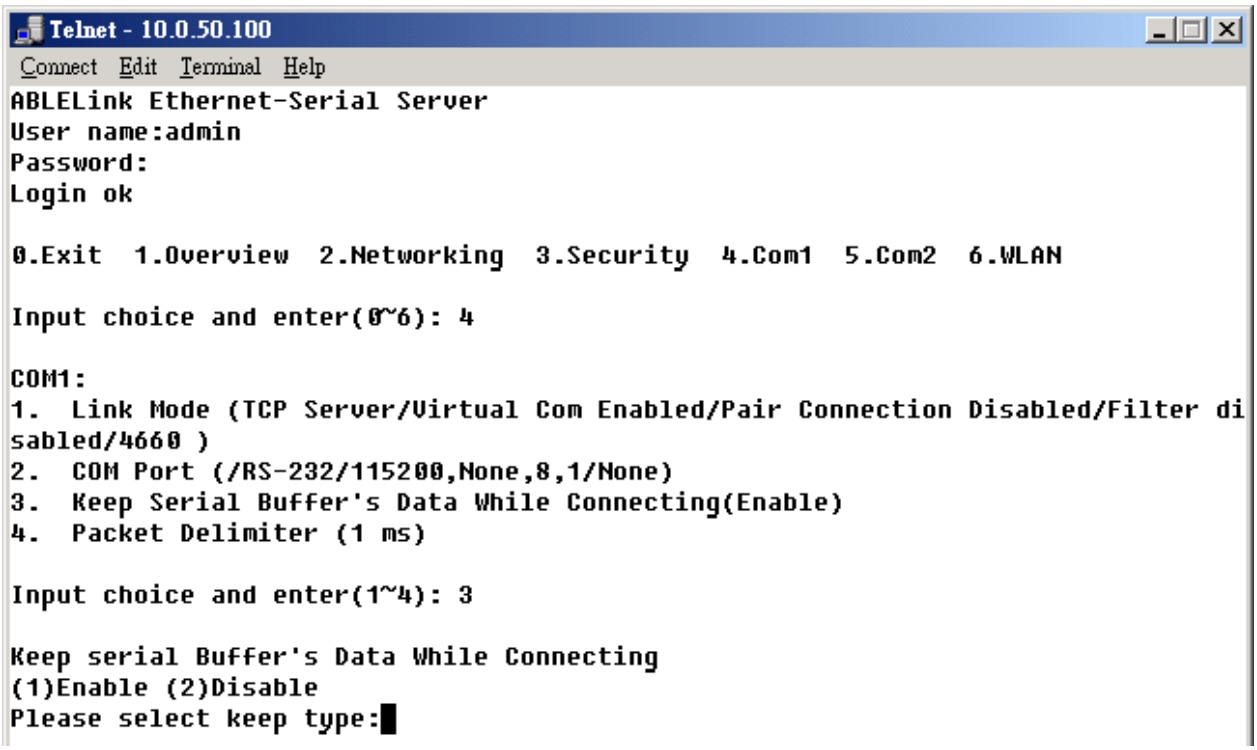
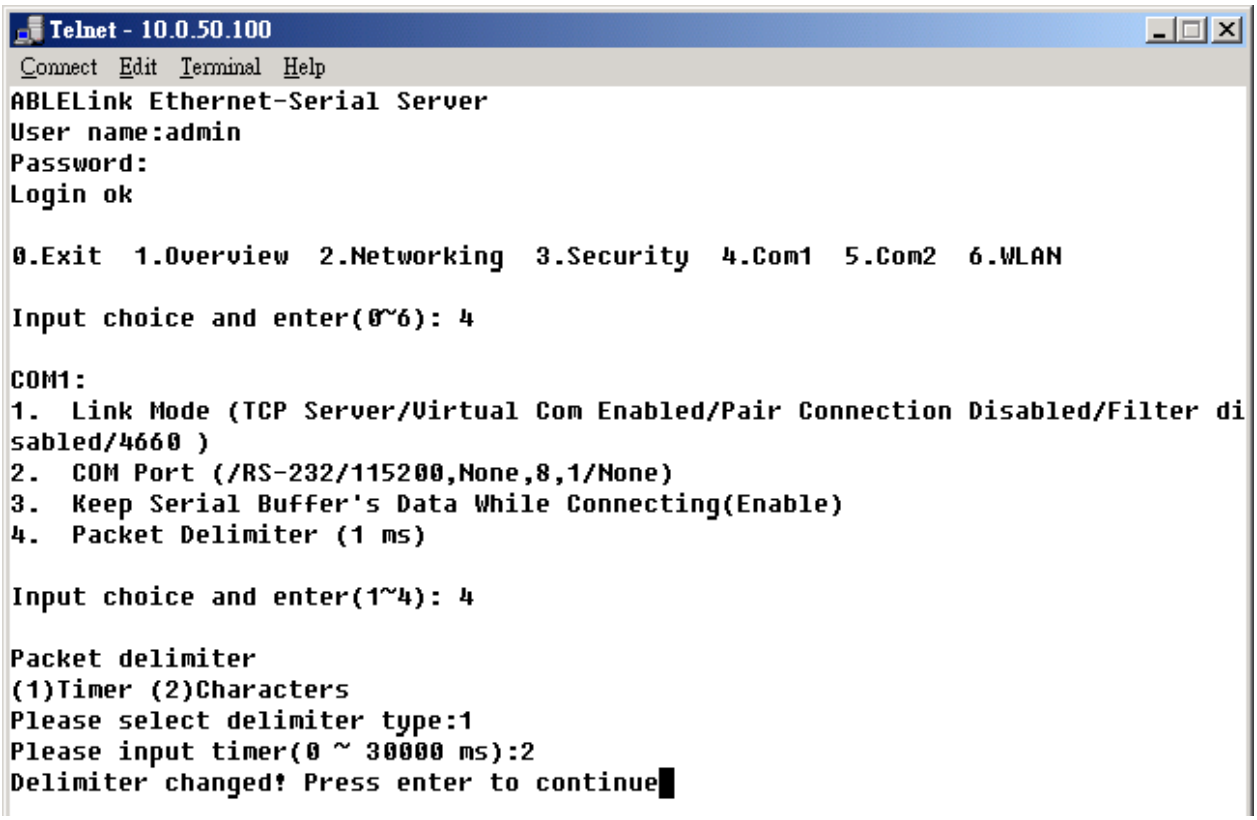

Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:
Login ok
0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.Com2 6.WLAN
Input choice and enter(0~6): 4
COM1:
1. Link Mode (TCP Server/Virtual Com Enabled/Pair Connection Disabled/Filter disabled/4660)
2. COM Port (/RS-232/115200,None,8,1/None)
3. Keep Serial Buffer's Data While Connecting(Enable)
4. Packet Delimiter (1 ms)
Input choice and enter(1~4): 3
Keep serial Buffer's Data While Connecting
(1)Enable (2)Disable
Please select keep type:

Setting packet delimiter

Packet delimiter is a way of controlling packets within serial communication. It can prevent packets from being cut thus keep the packets complete. GW21W provides two ways of parameter setting as inter character timer and terminator. By default packet delimiter timer is 0 ms, you can change timer shown in the following figure:


Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:
Login ok
0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.Com2 6.WLAN
Input choice and enter(0~6): 4
COM1:
1. Link Mode (TCP Server/Virtual Com Enabled/Pair Connection Disabled/Filter disabled/4660)
2. COM Port (/RS-232/115200,None,8,1/None)
3. Keep Serial Buffer's Data While Connecting(Enable)
4. Packet Delimiter (1 ms)
Input choice and enter(1~4): 4
Packet delimiter
(1)Timer (2)Characters
Please select delimiter type:1
Please input timer(0 ~ 30000 ms):2
Delimiter changed! Press enter to continue

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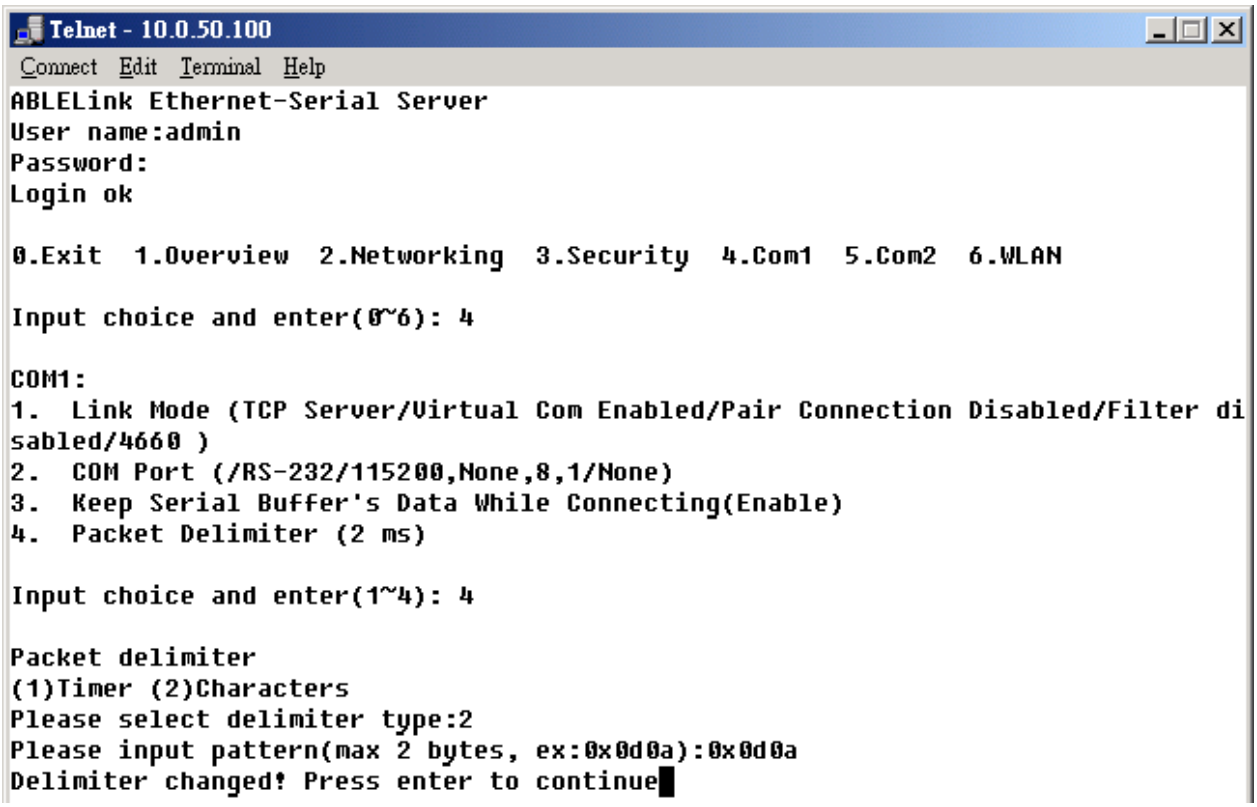
You can also choose character pattern as the packet delimiter indicated in the following figure:

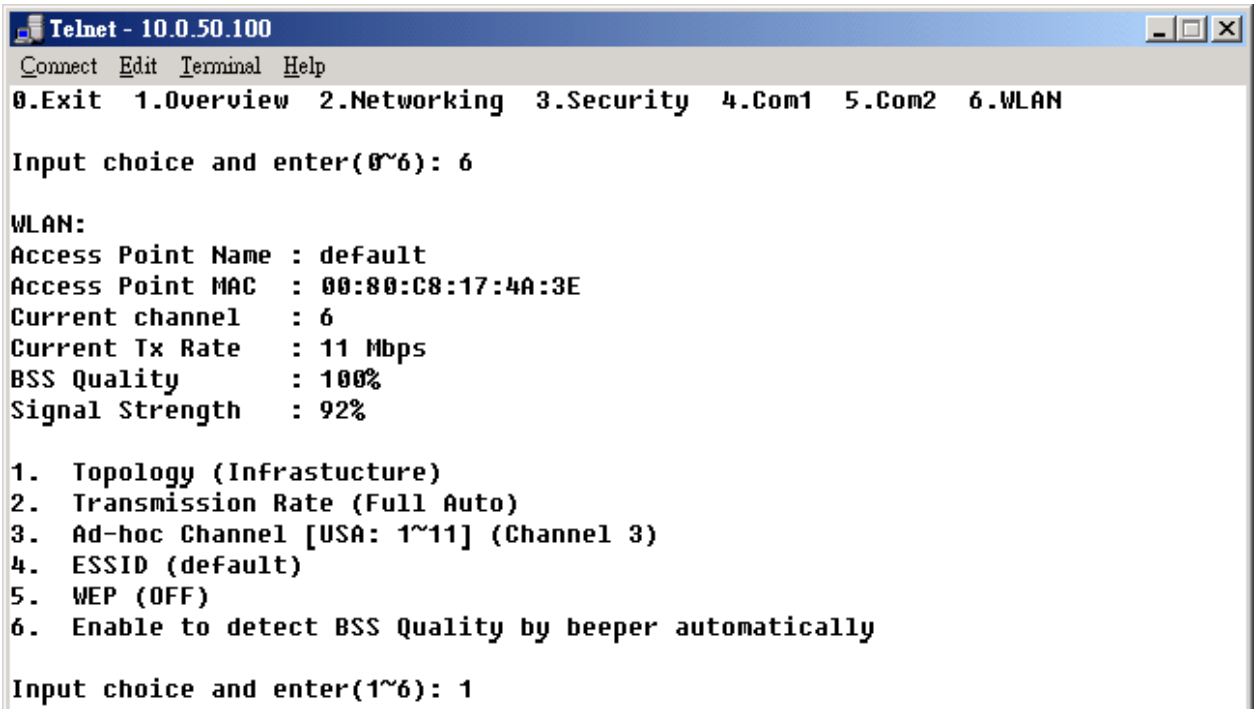

Telnet - 10.0.50.100
Connect Edit Terminal Help
ABLELink Ethernet-Serial Server
User name:admin
Password:
Login ok
0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.Com2 6.WLAN
Input choice and enter(0~6): 4
COM1:
1. Link Mode (TCP Server/Virtual Com Enabled/Pair Connection Disabled/Filter disabled/4660)
2. COM Port (/RS-232/115200,None,8,1/None)
3. Keep Serial Buffer's Data While Connecting(Enable)
4. Packet Delimiter (2 ms)
Input choice and enter(1~4): 4
Packet delimiter
(1)Timer (2)Characters
Please select delimiter type:2
Please input pattern(max 2 bytes, ex:0x0d0a):0x0d0a
Delimiter changed! Press enter to continue

COM2 Setup

Select “5” from “Input choice and enter (0~6):”, please refer “COM1 Setup” for the setup explanation.

Accessing Wireless LAN setting

Select “6” from “Input choice and enter (0~6):” the following screen appears.


Telnet - 10.0.50.100
Connect Edit Terminal Help
0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.Com2 6.WLAN
Input choice and enter(0~6): 6
WLAN:
Access Point Name : default
Access Point MAC : 00:80:C8:17:4A:3E
Current channel : 6
Current Tx Rate : 11 Mbps
BSS Quality : 100%
Signal Strength : 92%
1. Topology (Infrastucture)
2. Transmission Rate (Full Auto)
3. Ad-hoc Channel [USA: 1~11] (Channel 3)
4. ESSID (default)
5. WEP (OFF)
6. Enable to detect BSS Quality by beeper automatically
Input choice and enter(1~6): 1

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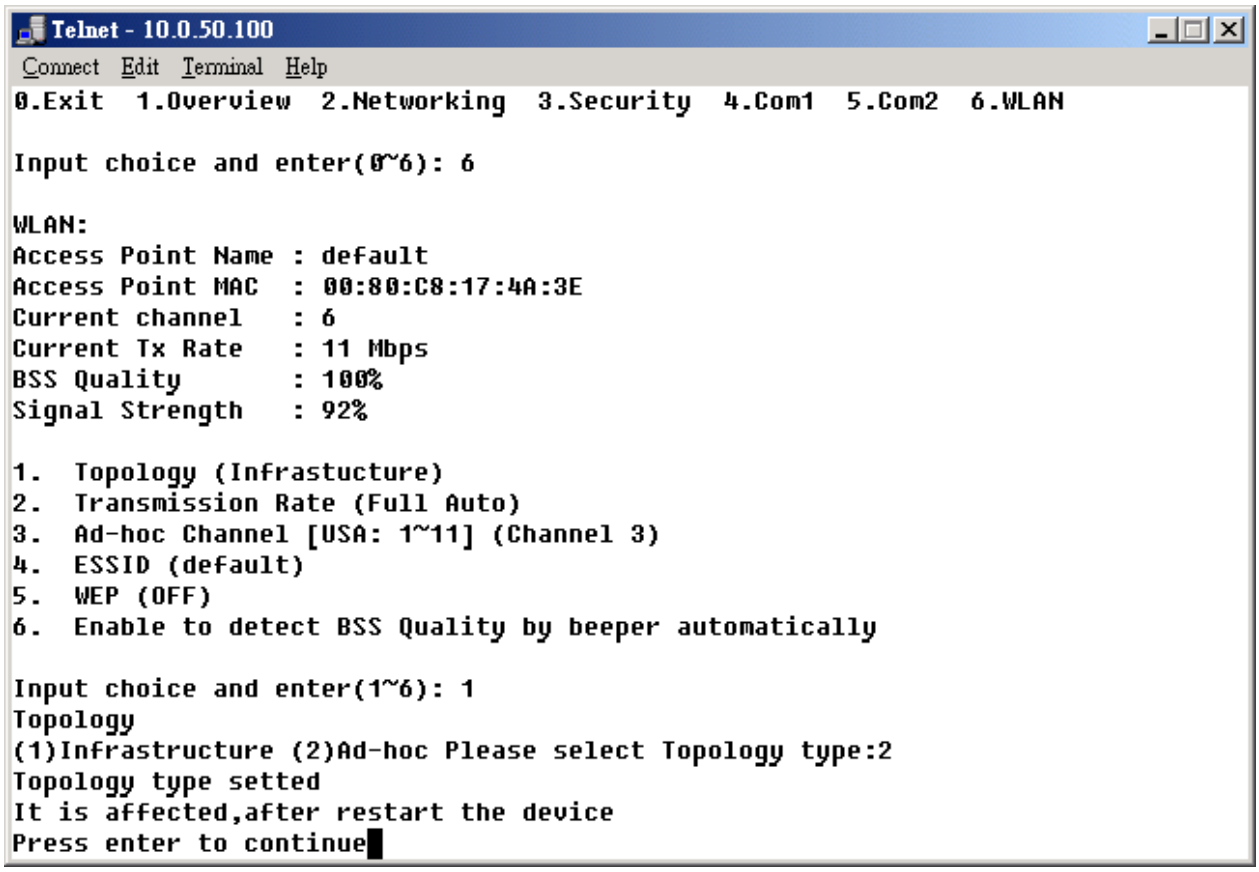
The above page gives you the general information about GW21W wireless configurations including the access point it connects to, the current channel and transmitting rate it communicates with the other wireless devices, topology it uses, and what the ESSID (extended service set identifier) and WEP (wireless encryption protocol) are if you use them.

Wireless LAN Tran


Telnet - 10.0.50.100
Connect Edit Terminal Help
0.Exit 1.Overview 2.Networking 3.Security 4.Com1 5.Com2 6.WLAN
Input choice and enter(0~6): 6
WLAN:
Access Point Name : default
Access Point MAC : 00:80:C8:17:4A:3E
Current channel : 6
Current Tx Rate : 11 Mbps
BSS Quality : 100%
Signal Strength : 92%
1. Topology (Infrastucture)
2. Transmission Rate (Full Auto)
3. Ad-hoc Channel [USA: 1~11] (Channel 3)
4. ESSID (default)
5. WEP (OFF)
6. Enable to detect BSS Quality by beeper automatically
Input choice and enter(1~6): 1
Topology
(1)Infrastructure (2)Ad-hoc Please select Topology type:2
Topology type setted
It is affected,after restart the device
Press enter to continue

Transmission Rate

You can set GW21W transmission rate as 1 Mbps, 2Mbps, 5.5Mbps, 11Mbps, or full auto based on 802.11 standard shown in the following figure:

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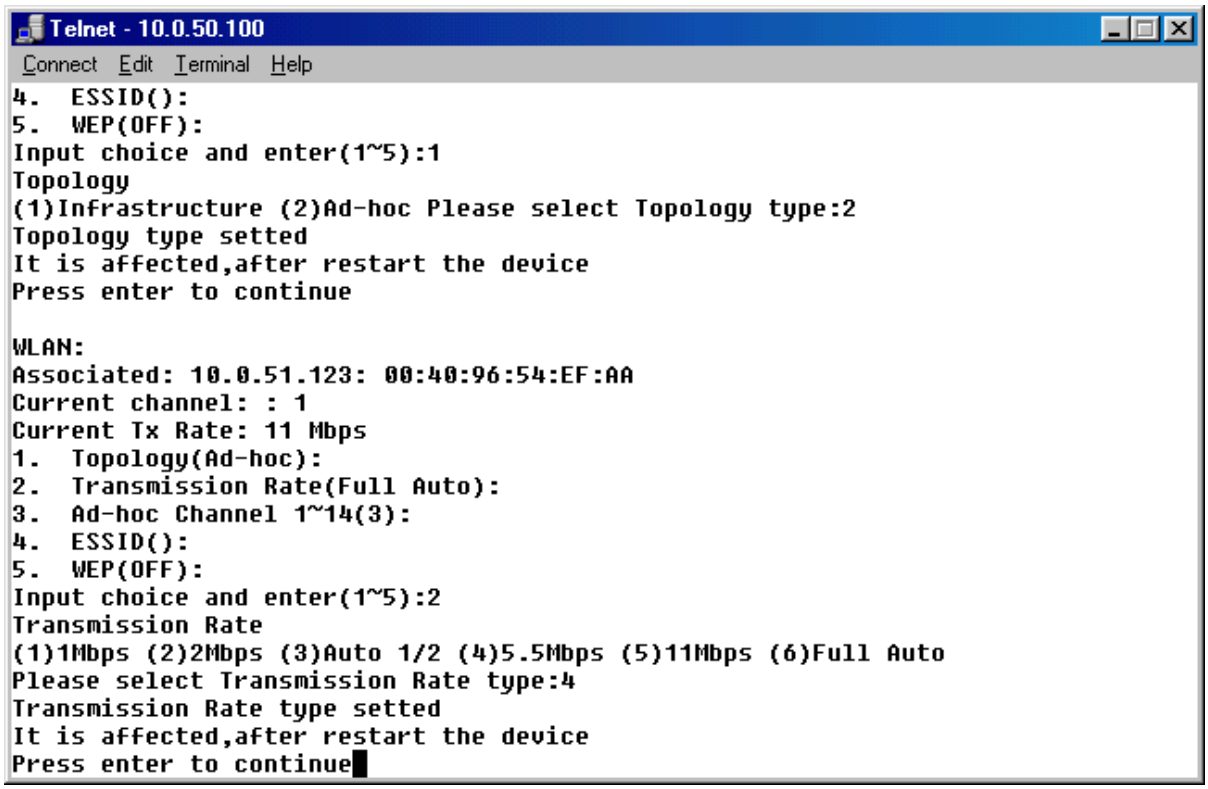
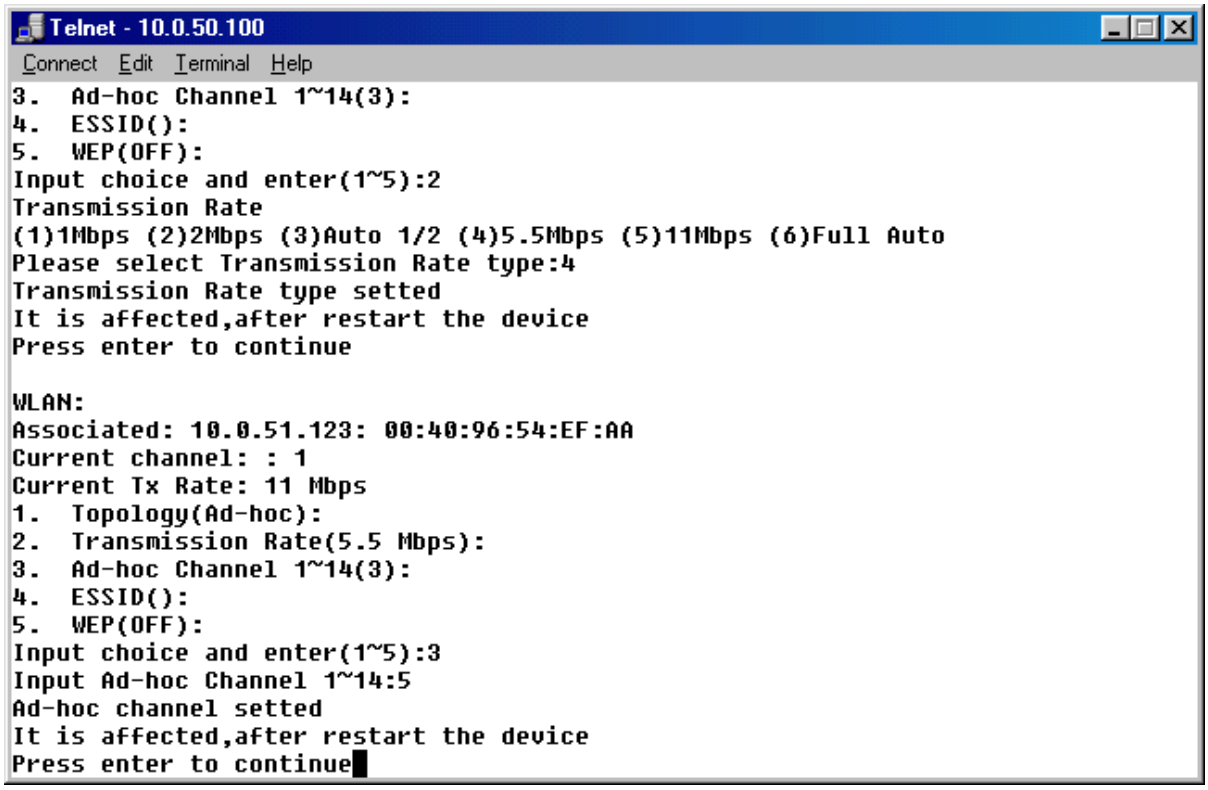


Wireless LAN Ad-hoc channel

You have to select the same channel for two wireless devices to talk to each other as indicated in the following figure:



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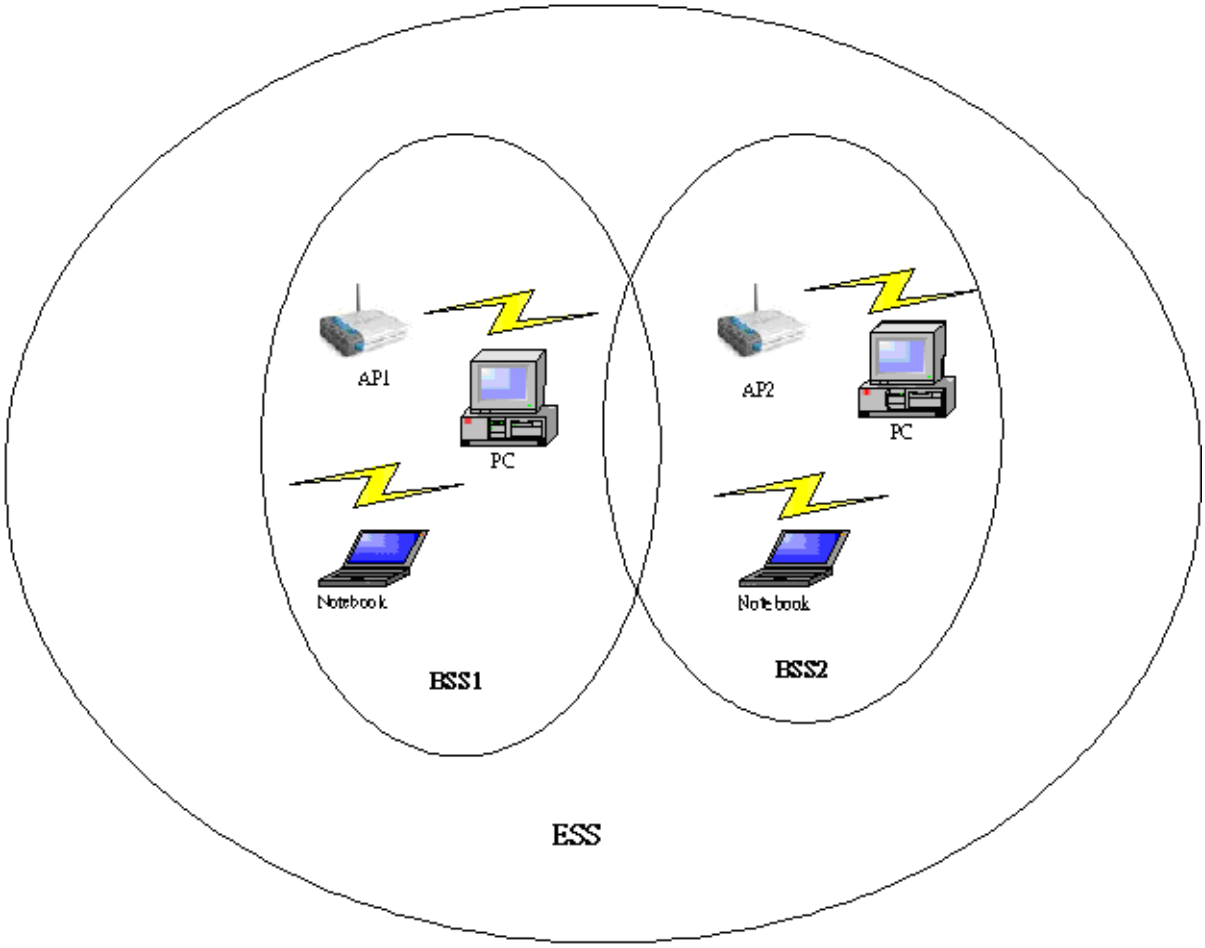
Wireless LAN ESSID

ESSID (extended service set identification) is used to identify all of the computers in the wireless LAN system, it is different from BSSID (basic service set identification) which contains a single access point (AP) and several other nodes. The following diagram illustrates this concept:



By default, GW21W's ESSID is NULL meaning that it can connect to any access point it detects regardless of SSID of the access point. However if there are two access points within the coverage of GW21W, it will not connect to either of them, in this case you have to specifically input the ESSID of one of the access points for connection. From telnet you can input ESSID as indicated in the following figure:

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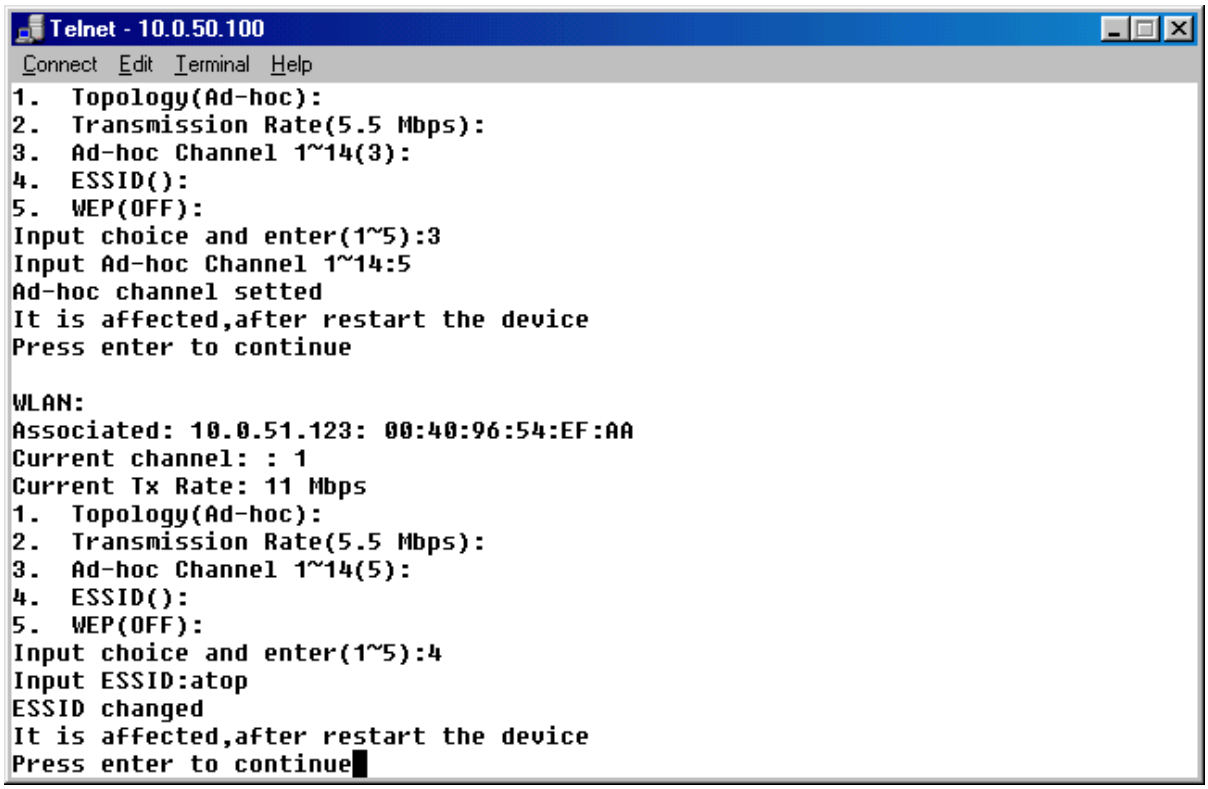
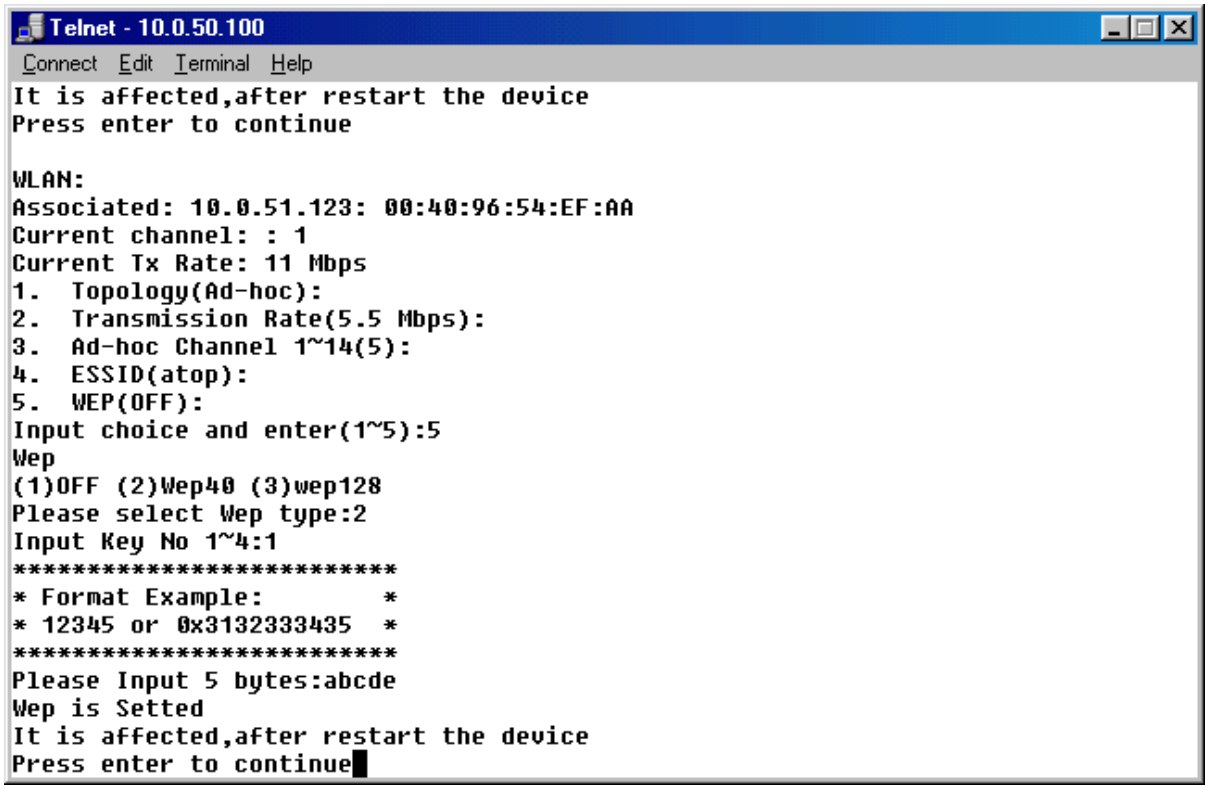


Wireless Encryption Protocol or Wired Equivalent Protocol (WEP) Setting

For security reason, GW21W can set up to use WEP key of 40 bits or 128 bits to securely communicate in the wireless network. Telnet WEP key set up screen is as following:



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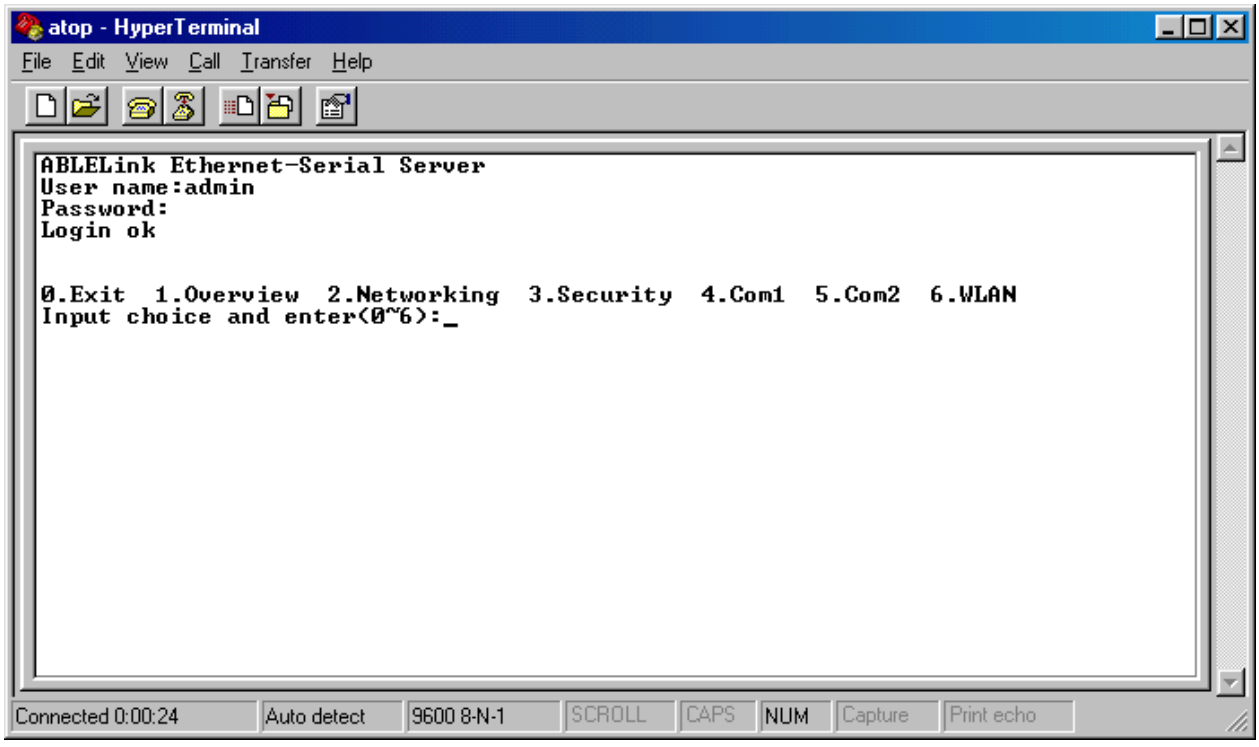
3.3 Configuration set by hyper terminal console utility

1. Use a PC to connect to GW21W's COM1 with RS-232 cross over cable.

   (Please make sure COM1 is RS-232 type)

2. Open a hyper terminal program from your computer Start menu -> Programs -> Accessories -> Communication -> hyper terminal, set COM1 parameters as follows.
   - Baud rate: 9600bps
   - Data bit: 8 bits
   - Parity: None
   - Stop bit: 1bit
   - Flow control: None
3. Power on GW21W
4. Wait the device finishing the initialize (Listen to the beeper sound).
5. Send the character 'Z' or 'z' three times within two seconds.
6. Once hyper terminal is connected, type in username and password then the following hyper terminal window appears.



7. The following configuration operations are totally the same as those configure by Telnet.
8. After finishing console settings, restart GW21W.

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3.4 Configuration set by web browser

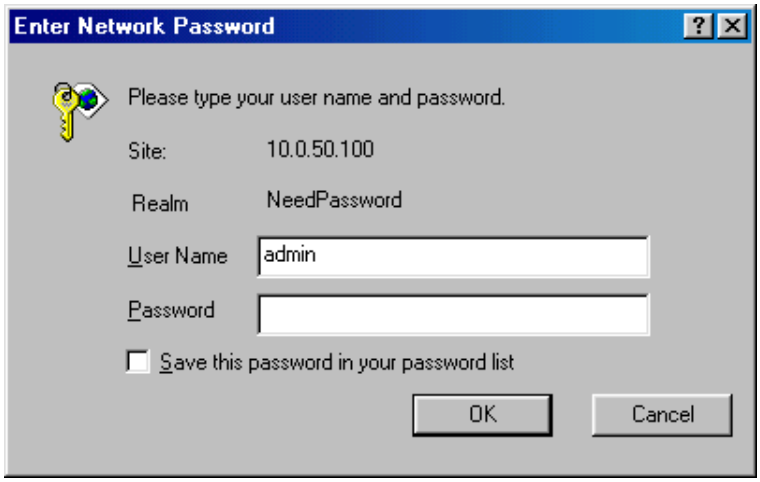
It is also possible to modify various settings through the web server interface. To do so, please follow the steps below.

Log in to the system

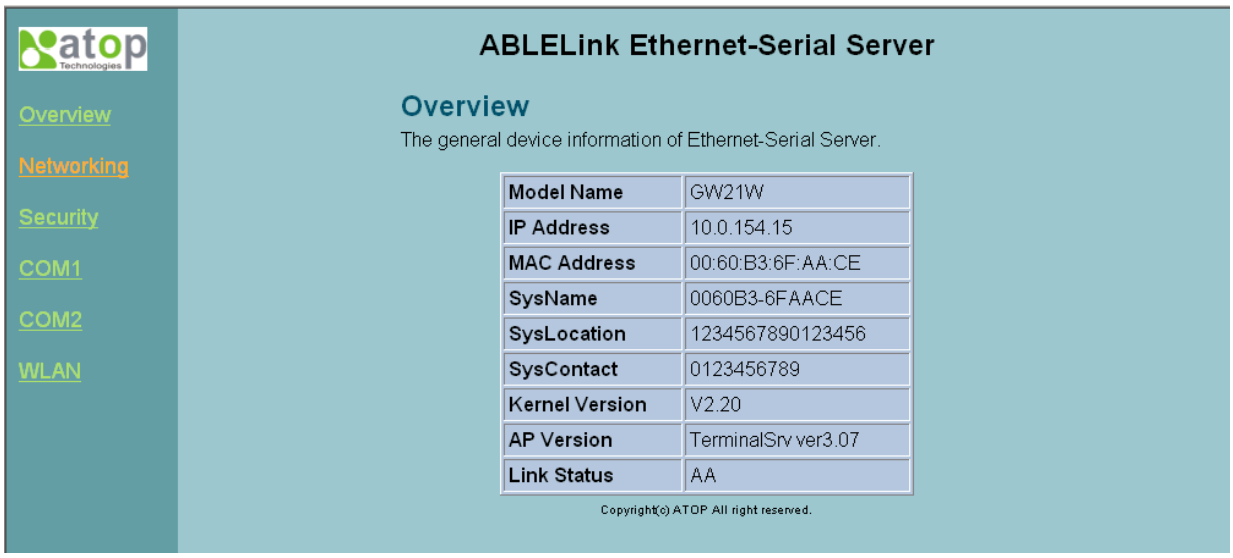
1. From web browser, type in the IP address of GW21W in the URL.

   Example: http://10.0.50.100

2. The following authentication screen appears. Please type in user name and password then click on "OK". The user name is **admin** and password is **null** by default.



3. The following overview page appears.



Change the password

1. Click on the "Security" link and the following screen appears.

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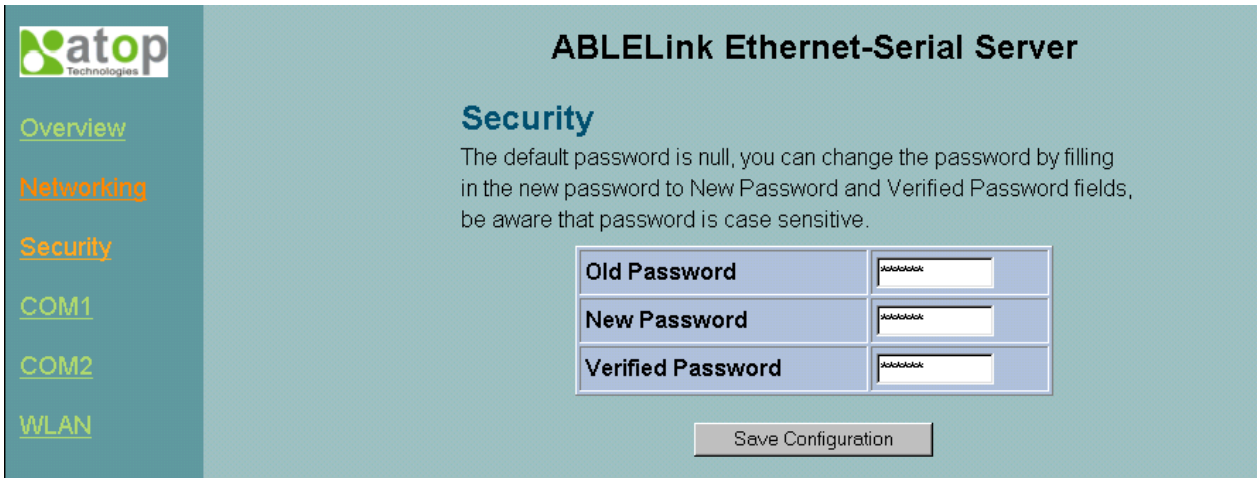
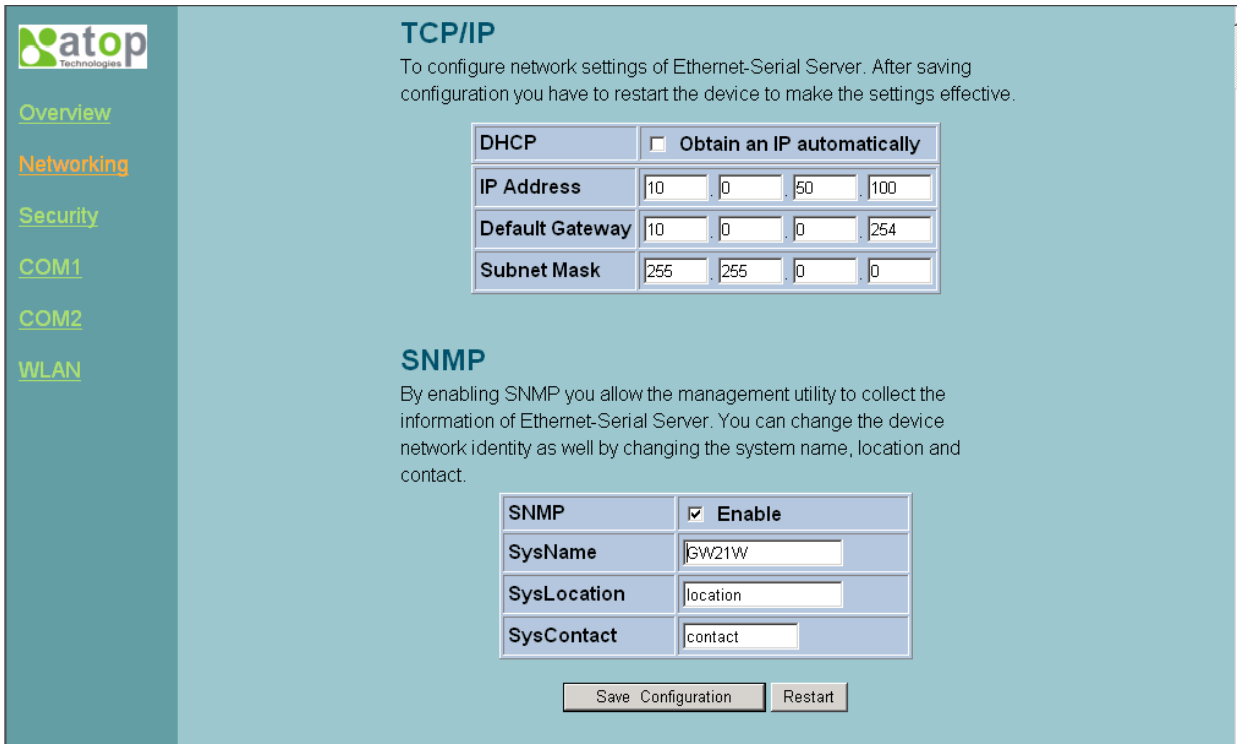


2. Please input the old password in the "**Old Password**" field, input the new password in the "**New Password**" and the "**Verified Password**" fields. Then click on "**Save Configuration**" to update the password.

Note: You can press the reset key of product to reset password to the default value.

Network setup

Click on the "Networking" link and the following screen appears. Fill in IP information under TCP/IP field. Enable SNMP by checking "Enable", fill in network identification information under SNMP field and click on the "Save Configuration" button to save the changes, please notice that the setting will not become effective until you restart GW21W.



COM1 Setup

Click on the ***"COM1"*** link and the following screen appears. Fill in COM1 parameter information under COM1 field then click on "Save Configuration" button to save the changes.

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LINK1 Setup

1. Click on the “COM1” link and the following screen appears, you can configure GW21W as transparent mode by default. Configure GW21W as TCP server and the local port is 4660, IP filter is disabled by default, if IP filter is enabled, only source IP 10.0.29.11 can connect to GW21W.

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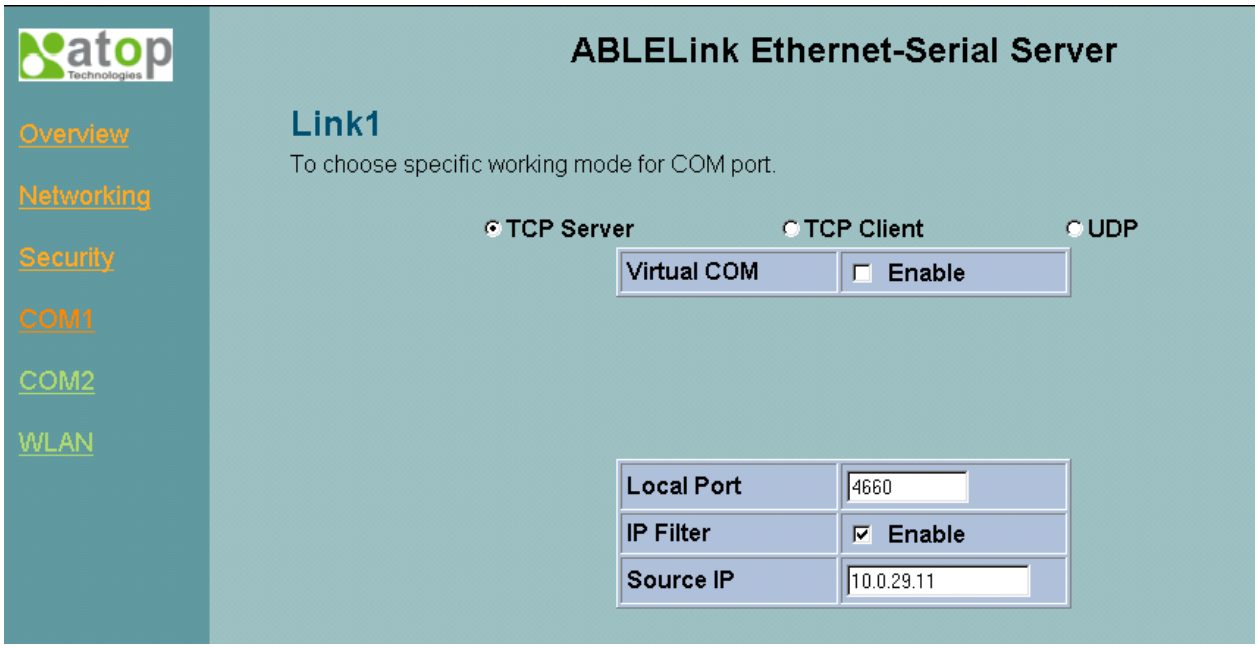
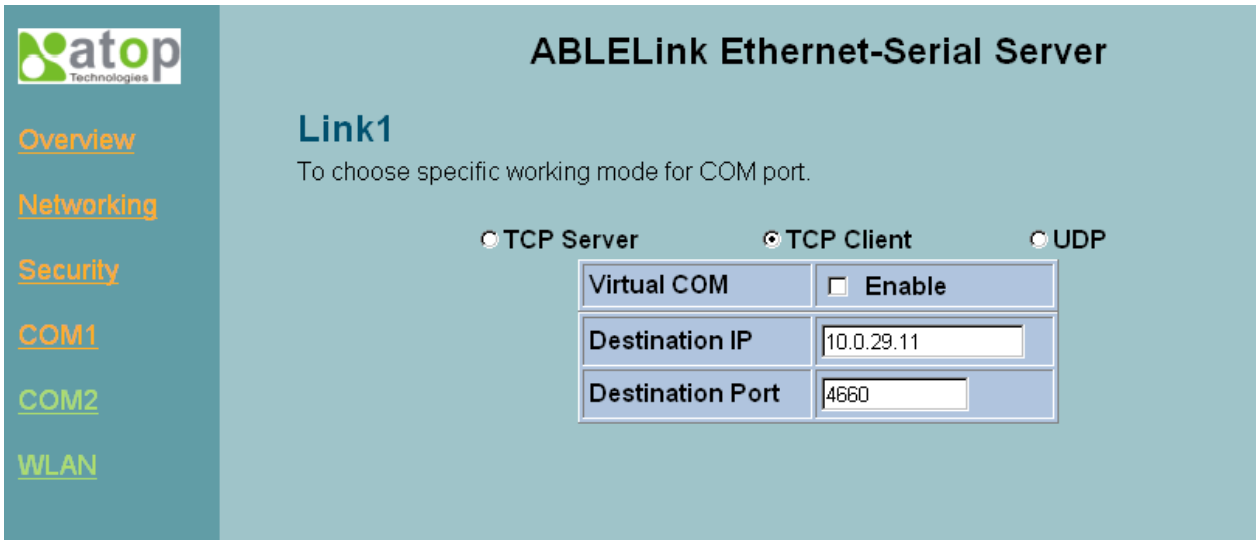


Configure GW21W as TCP client, the destination IP is 10.0.29.11, destination port is 4660.



Configure GW21W as UDP mode. Local port is 666, destination IP is 10.0.29.11 and destination port is 4660.

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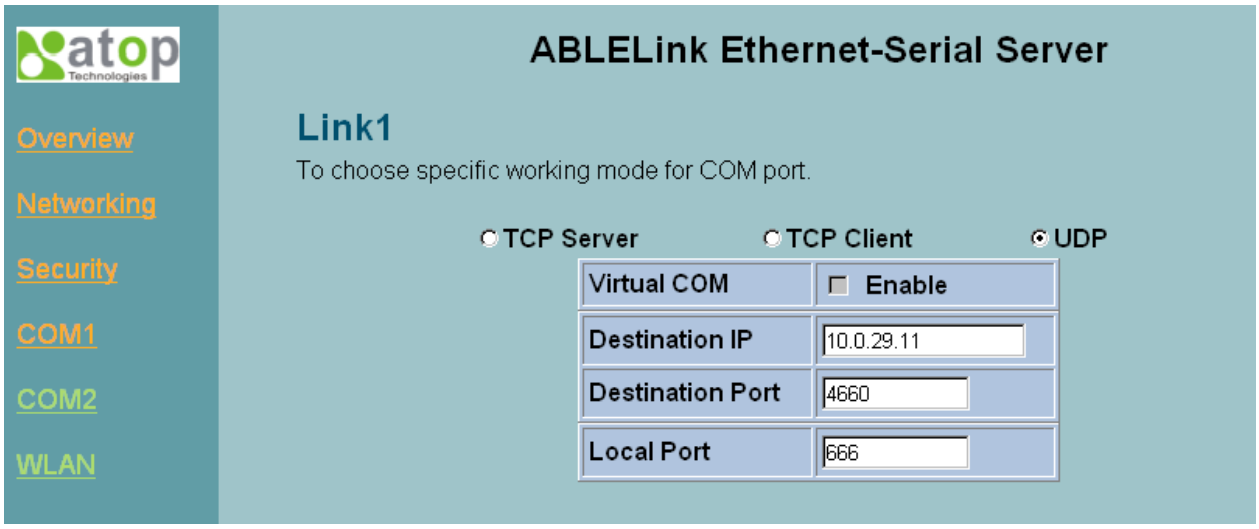

2. Click on “Save Configuration” to save the changes.
3. If the update is successful, the following screen appears.

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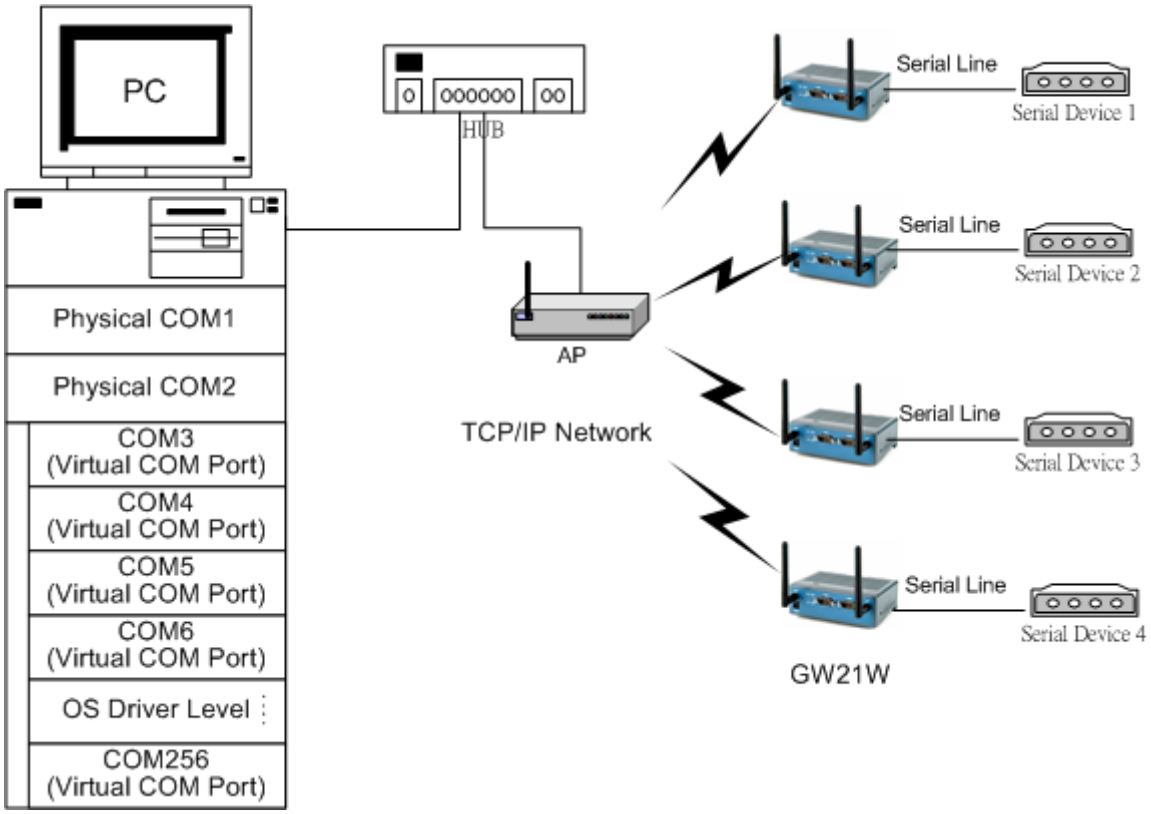
4 Virtual COM Mode

Virtual COM driver mode for windows converts COM data to LAN data to control the RS-232C port on a GW21W via the LAN. By creating Virtual COM ports on the PC, Atop Virtual COM redirects the communications from the Virtual COM ports to an IP address and port number on a GW21W that connects the serial line device to the network. The following figure is Atop Virtual COM connection diagram.



4.1 Setup of a Virtual COM driver

Pre-installation requirements

Please check the operation system on your PC complied with the following requirements:

- Processor: Intel-compatible, Pentium class
- Operation system: Windows Server 2003, Windows XP, Windows 2000, Windows NT 4.0 SP5 or later, Windows Me, Windows 98, Windows 95, Microsoft NT/2000 Terminal Server, Citrix MetaFrame
- Windows Installer 2.0
- Network: Microsoft TCP/IP networking software

Applying to the serial server

Cautions on Use

Atop Virtual COM supports firmware AP v3.4 and above of ABLELink Serial-Ethernet Servers.

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Limitation

Atop Virtual COM driver provides user to select up to 256 **COM ports** as Virtual COM ports in a monitoring PC. User can select them from a list of COM ports, which is from COM1 up to COM256.

Installation

Make sure you have turned off all anti-virus software before beginning the installation. Run AtopVcom.exe program included in the CD to install Atop Virtual COM for your operating system.

In the end of the installation, please select one or two COM ports to become the Virtual COM ports.

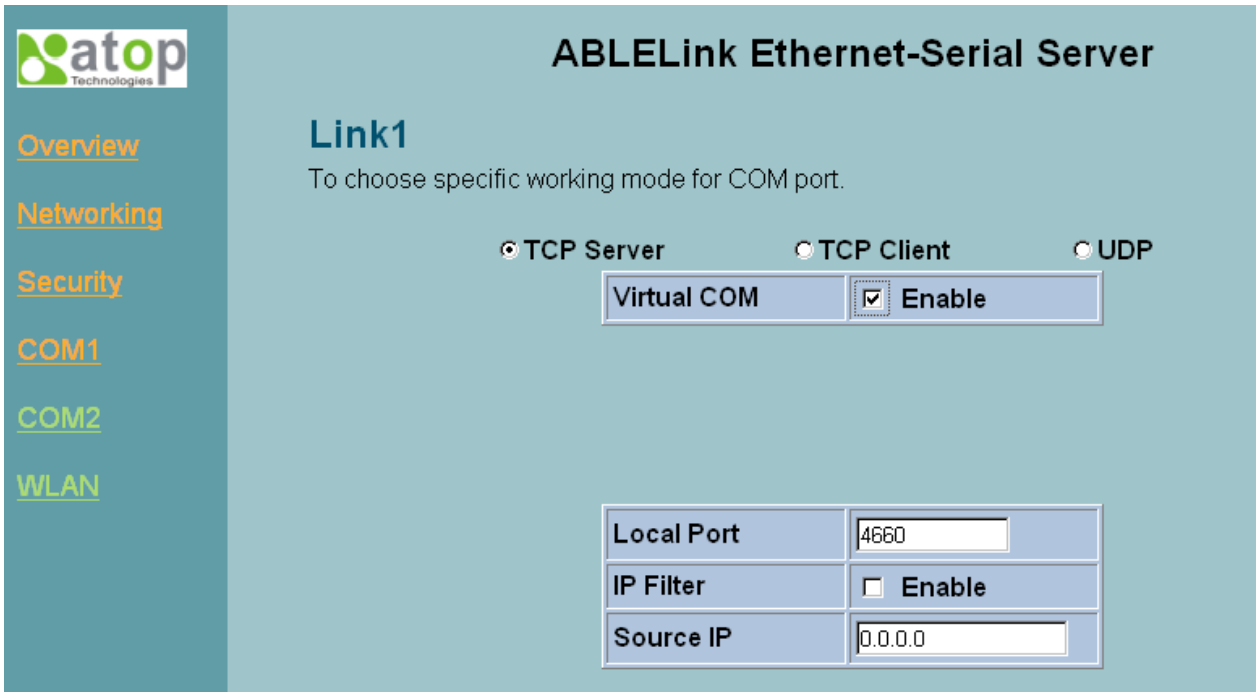
Uninstalling

1. From Windows Start menu select Setting, Control Panel, Add/Remove Programs.
2. Select **Serial IP for ATOP** in the list of installed software.
3. Click the **Add/Remove** button to remove the program, or From Windows Start menu select Programs, Serial IP for ATOP, **Uninstall Serial IP for ATOP** to remove the program.

4.2 Virtual COM communication

Enable virtual COM on GW21W

From web browser access to GW21W by typing its IP address, click on COM1 or COM2 link to access COM1 or COM2 page, on the top half of the page click on “TCP Server” and enable Virtual COM by putting a check in front of the “Enable” button, then type in the local port number in the “Local Port” field as indicated in the following figure:



or you can enable Virtual COM through Telnet by setting COM1 or COM2 as TCP server, and type in the local port number for COM1 or COM2, then enable Virtual COM as shown in the following figure:

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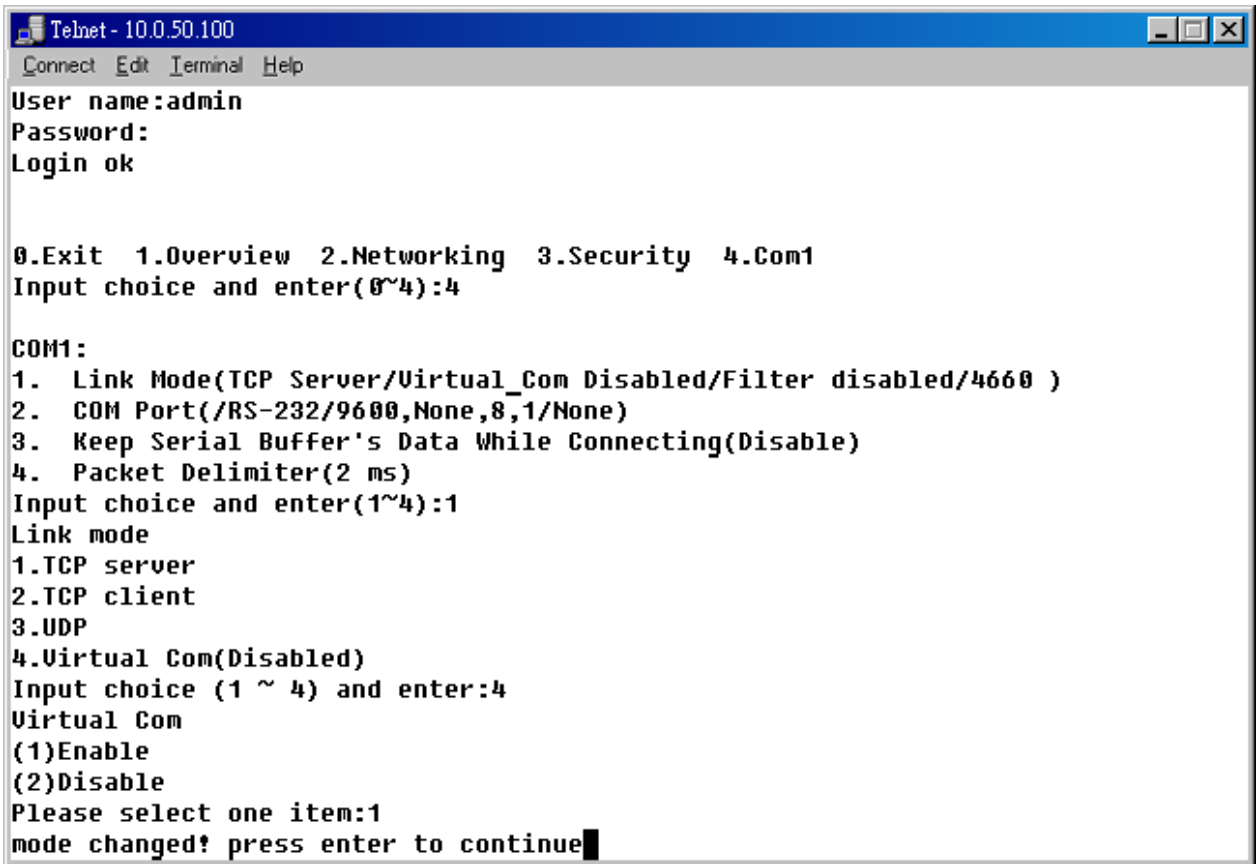

4.2.1Run Serial/IP for ATOP program on monitoring PC

In the Window Start Menu, select the Serial/IP for ATOP program group and select **Serial/IP for ATOP Configuration**. The configuration window is shown as following:

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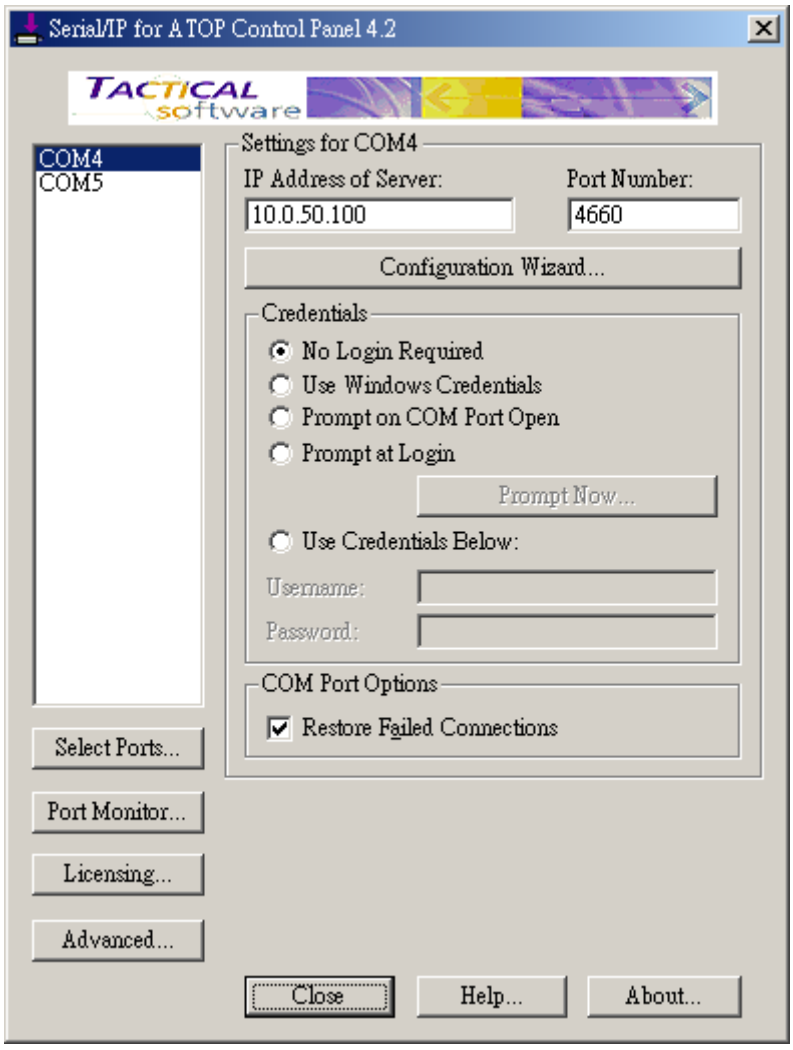

At right is a sample Virtual COM Control Panel window. At the left is the list of the COM ports that you have selected (in the Select Ports window) for use by the Virtual COM Redirector. If you wish to change which ports appear in this list, use the **Select Ports** button.

Each COM port has its own settings. When you click on a COM port, the Control Panel display changes to reflect the settings for that COM port.

Note: When you change settings for a COM port, the changes are effective immediately. There is no separate confirmation dialog to confirm or cancel your changes.

Configuring Virtual COM Ports

You configure each Serial/IP COM port as follows:

1. Select a COM port in the list.
2. For **IP Address of Server**, enter a numeric IP address for the serial server.
3. For **Port Number**, enter the TCP port number that the serial server uses to provide its serial ports to the network.
4. For **Server Credentials**, the default is **No Login Required**. If your serial server does require a login by the Virtual COM Redirector, the Virtual COM Redirector needs to provide a username and/or password every time an application tries to use the serial server.
5. Click the **Configuration Wizard** button and then click the **Start** button that appears in the wizard window. This important step verifies that the Virtual COM Redirector can communicate with the serial server using the settings you have provided. If the **Log** display does not show errors, click the **Use Settings** button in the wizard, which makes the recommended settings effective and

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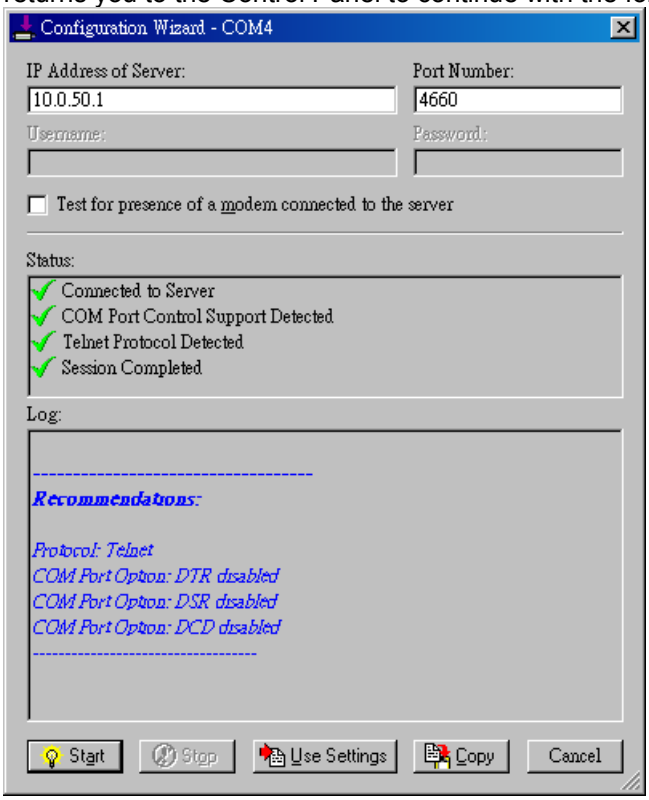
returns you to the Control Panel to continue with the following steps.



6. For Connection Protocol, the setting must match the TCP/IP protocol that the serial server supports. The Configuration Wizard is usually able to determine the correct setting.
7. For COM Port Options, the settings must match the COM port behavior expected by the PC application that will use this COM port. The Configuration Wizard will recommend a combination of settings.

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5. SNMP Setup

5.1 SNMP Network Management Platform

Atop GW21W is an SNMP device that allows many popular SNMP network management platforms such as HP OpenView and SunNet Manager to conduct monitoring on the device.

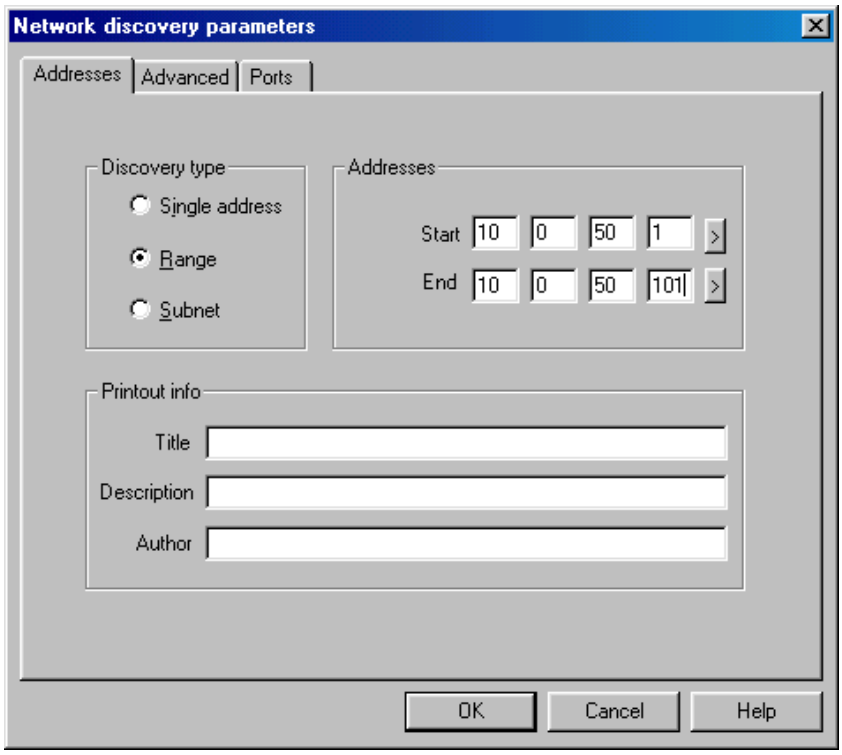
Depending on the network management tools you are using, device (GW21W) information can be collected from running the management tools including IP address, DNS name, system descriptions and NIC information etc.

5.2 Using NetworkView As An Example

The NetworkView is a compact network management tool from NetworkView Software, Inc. (www.networkview.com). It discovers all TCP/IP nodes in a network using DNS, SNMP and ports information and documents with printed maps and reports for future use. You may visit their web sites and get a free download.

To use NetworkView, you will need to download and install the tool on your PC (**Windows NT and Windows 9x only**). Please refer to the installation instructions that come with the tool.

1. After you have done the NetworkView installation, start NetworkView.
2. Click on the button to open a new file. The following screen appears, in the Addresses field, type in the IP address range to search.



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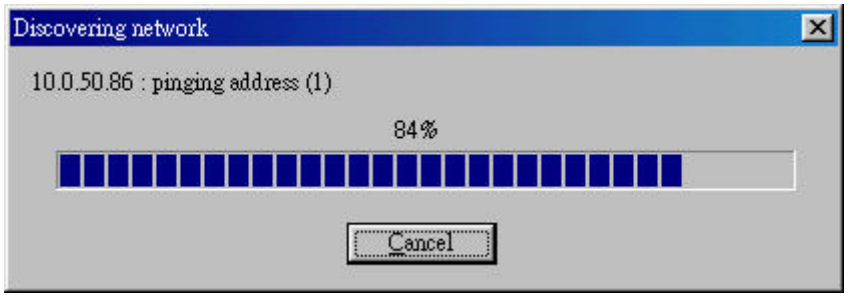
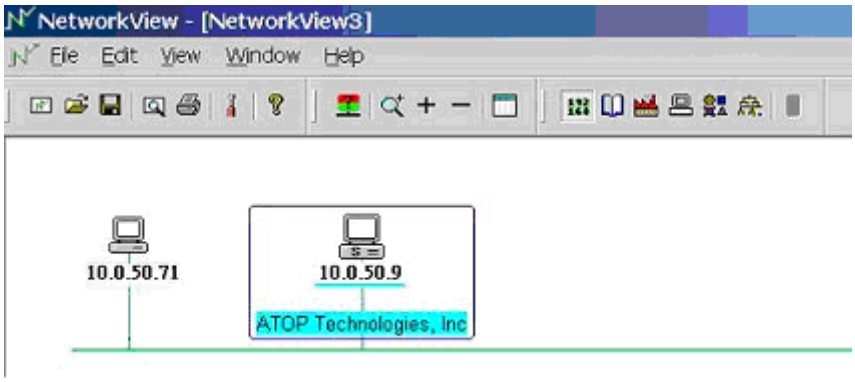
3. Click on “OK” and the following dialog box appears. It displays the searching progress.



4. When the search is completed, NetworkView will display the devices found in the main window, as shown in the following diagram.



5. Double-click on the device icon to display information about the device, including IP Address, Company, SysLocation (Max 15 characters), SysName (Max 9 characters) and types etc.

Note:

1. The NetworkView tool is limited to information extracting and viewing only.
2. To modify the configurations please use the web server, Telnet or monitor.exe configuration utilities.

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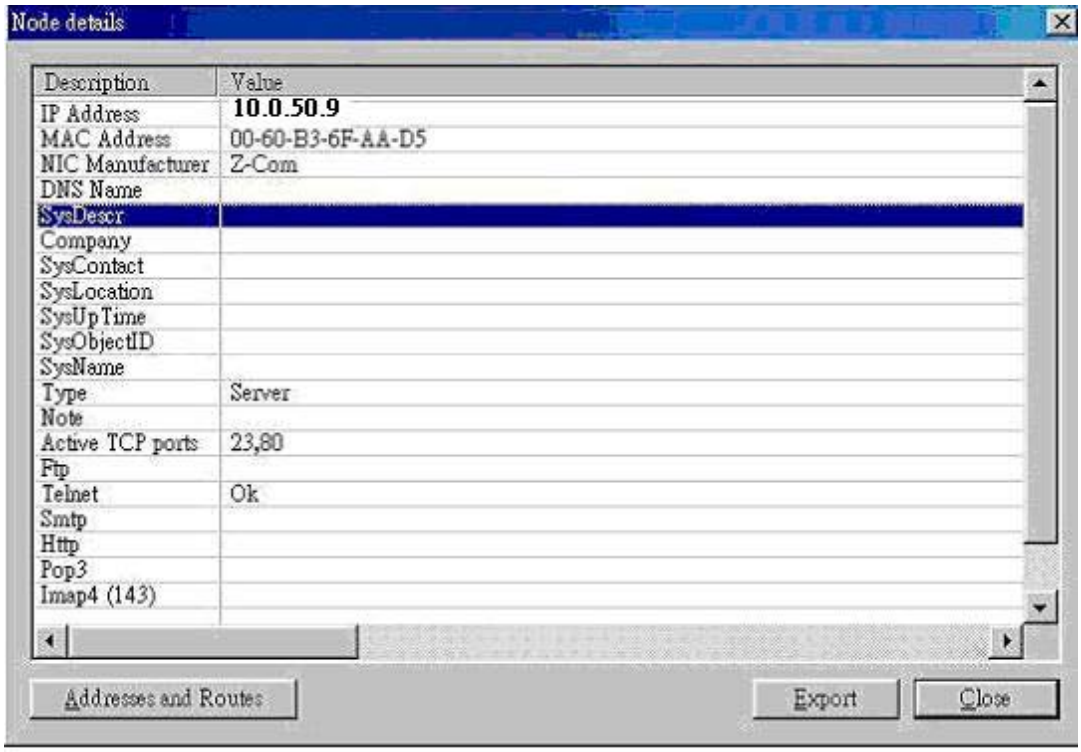

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6. Start Writing Your Own Applications

Before you start writing your host applications or programs to interact with GW21W, please make sure you have done the following.

6.1 Preparing The System

1. Properly connect GW21W hardware including power, Ethernet and RS-232/RS-485 cables.
2. Properly configure the parameters of GW21W including connection type, IP address, gateway IP address, and network mask accordingly (see chapter 2 **Hardware Installation** section).
3. Configure GW21W as TCP Server using default TCP port number 4660.
4. The host (PC) application program must be configured as a TCP client and connects to GW21W with designated TCP port number 4660 for COM1.
5. Make sure GW21W is running by checking the running status through **monitor.exe** configuration utility.

6.2 Running The Sample Program

Sample programs written in VB and VC++ included in package are provided for your reference, source codes are also included. Test program can be found in the product CD or diskette under the directory of ***sample*****vb_ap**\ and ***sample*****vc_ap*** respectively.

There are two test programs, TCPTEST written in Visual Basic and TCPTEST2 written in Visual C++.

6.2.1TCPTEST in Visual Basic

This sample program is written in Visual Basic 5.0 with Winsock Controls. It shows you how to send and receive data between host (PC) and GW21W via Ethernet in two socket ports.

Run Visual Basic and open sample program tcptest.vbp, after the program is started successfully, you can start testing functions. For more information, please press **Help** in the program to get detail explanation.

Note: Please be sure the Microsoft visual studio family software is installed on the computer. Otherwise the sample program will not run.

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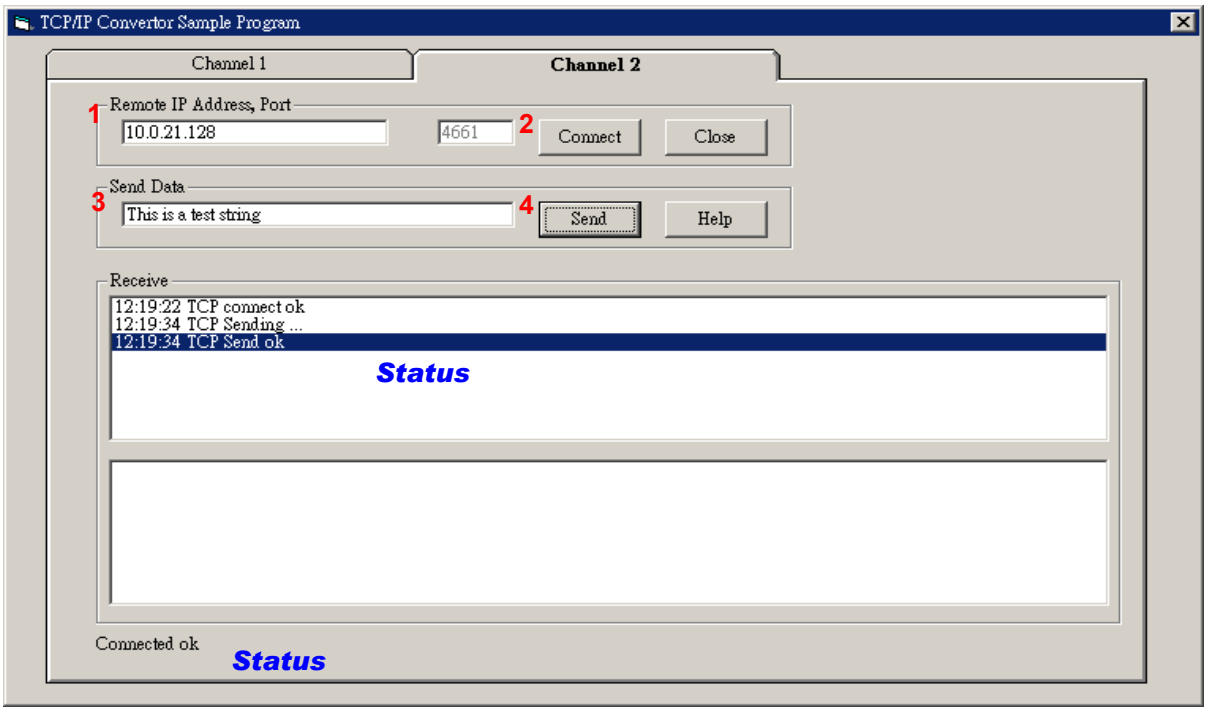
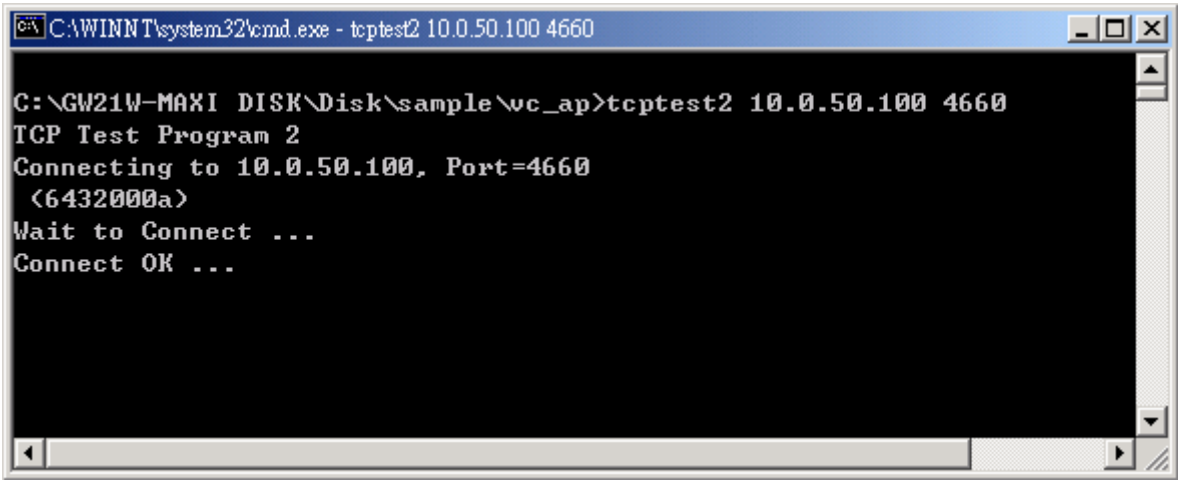


6.2.2 TCPTEST2 in Visual C

To start the program, please type in the following command in the command line prompt:

TCPTEST2 IP_Address Port_Number



The command ***tcptest2 10.0.50.100 4660*** brings you to connect to a TCP server of IP address *10.0.50.100* and port number *4660*, the received data is displayed on the screen and the data typed in is sent to the TCP server of the designated port number. You can also send binary data in hex format with a leading character "\". For example, "\00" and "\FF" represent ASCII code 0 and 255 respectively.

You can also use modem to connect to the serial server. Command "***AT\Od***" sends standard AT command to the modem which in return responds with "***OK\0D\0A***" message to the host application.

Always use '**=**' then Enter key to exit the program.

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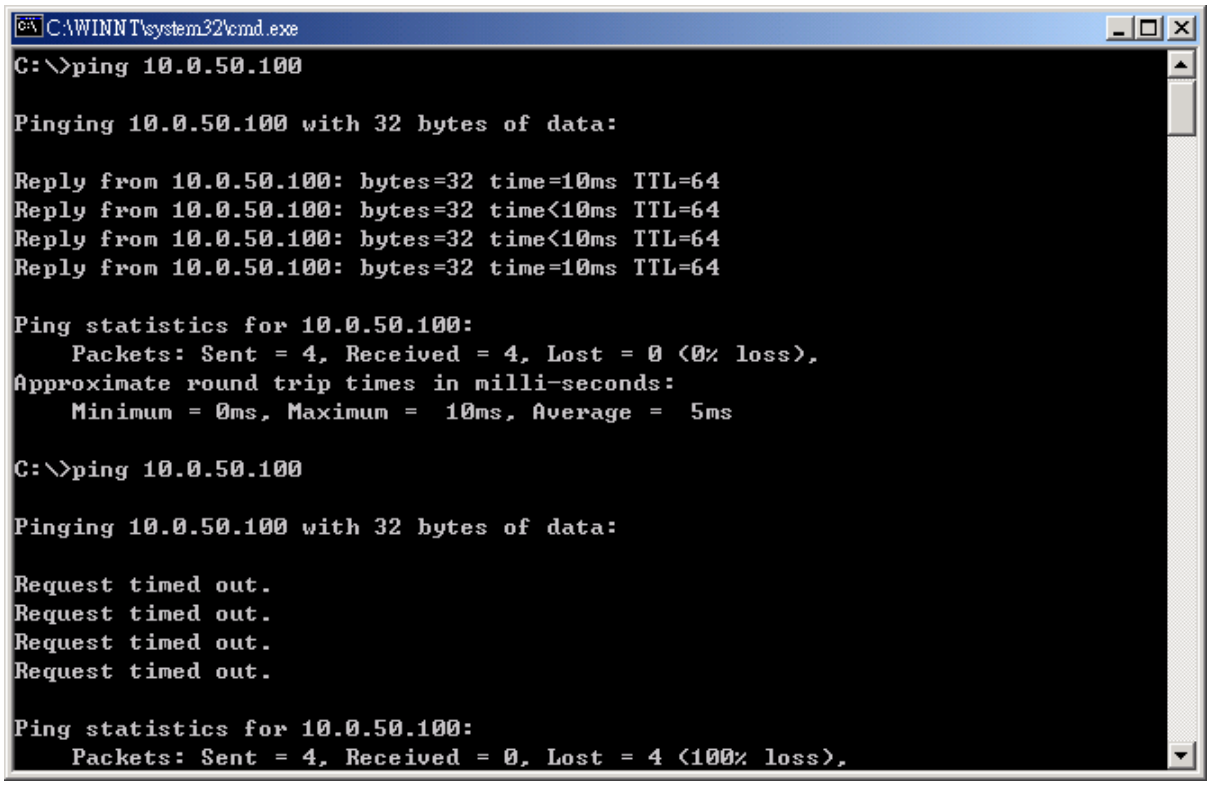
7. Diagnostics

There are several ways you can check on the status and availability of GW21W.

7.1 Use Standard TCP/IP Utility *ping* Command

From Windows **Start** menu, select **Run** and type in "**ping <TCP Server IP address>**".

If the connection is established, the Reply messages are displayed, otherwise it will indicate Request timed out.


C:\WINNT\system32\cmd.exe
C:\>ping 10.0.50.100
Pinging 10.0.50.100 with 32 bytes of data:
Reply from 10.0.50.100: bytes=32 time=10ms TTL=64
Reply from 10.0.50.100: bytes=32 time<10ms TTL=64
Reply from 10.0.50.100: bytes=32 time<10ms TTL=64
Reply from 10.0.50.100: bytes=32 time=10ms TTL=64
Ping statistics for 10.0.50.100:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 10ms, Average = 5ms
C:\>ping 10.0.50.100
Pinging 10.0.50.100 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 10.0.50.100:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

7.2 Use monitor.exe Configuration Utility Program

Use monitor.exe configuration program that comes with the product CD or diskette to check on the status of GW21W. The status can be read from "***AP version***" column of the tool.

Status	Descriptions
S	The system is configured as a TCP Server and not yet connected.
C	The system is configured as a TCP Client and not yet connected.
U	The system is configured as an UDP.
A	The TCP Server and is connected.
B	The TCP Client and is connected.

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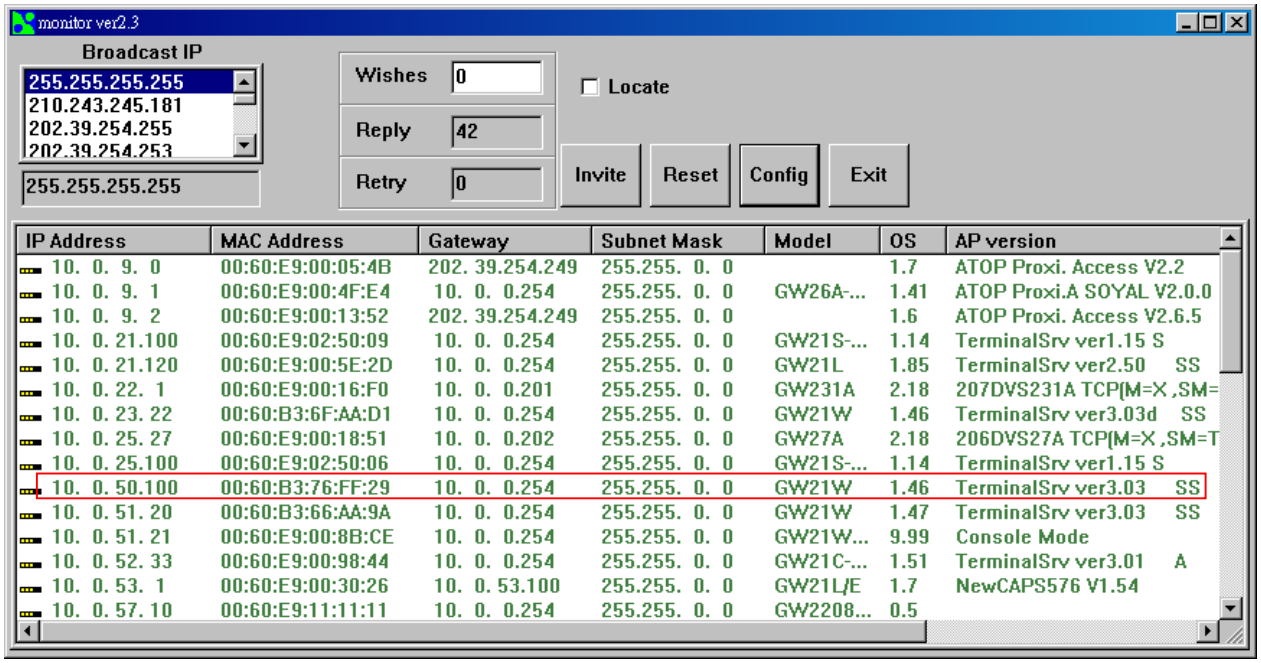
For example, **'s'** means that COM1 is server mode and is not connected.



7.3 Use TCPTEST.EXE or TCPTEST2.EXE Sample Program

Use sample programs TCPTEST.EXE and TCPTEST2.EXE that comes with the product CD or diskette to check on the status of GW21W. Please refer to chapter 6.2 to run the sample programs.

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Appendix A: GW21W Serial-Ethernet Server Specifications

A.1. Hardware Specifications

	Specifications
CPU	• 16-bit Embedded CPU • 40MHz
Flash Memory	• 512K Bytes
SRAM	• 256K Bytes
EEPROM	• 512 Bytes
Host Communication	• IEEE802.11b 11 Mbps Wireless LAN • TCP/IP, UDP, SNMP, HTTP, Telnet, ARP, BOOTP, ICMP, DHCP
Reset	• Built-in reset key for restoring default parameters
Watch Dog Timer	• 1 second hardware auto reset • Power failure threshold: 4.75V
Serial Port Communication	• Two serial ports RS-232 or RS-485 is selectable • RS-232: EIA-RS-232C standard, Full Duplex, 9 pin Male D-type • RS-485: 2/4 wires, Half/Full duplex, 9 pins Male D-type. • Parameters 1) Baud-rate: 1200 bps ~115200 bps 2) Parity: None, Even, Odd, Mark, Space 3) Data bits: 7,8 4) Stop bits: 1,2 5) Packet Delimiter: by inter-character timeout, by characters delimiter 6) Flow Control: None, Hardware handshake, software Xon/Xoff
LED indication	• RUN x 1 • LAN x 1 • COM port1 • COM port2
Power Requirement	• +12Vdc @ 350mA
Temperature	• Operation: 0℃ to 50℃ • Storage: -20℃ to 70℃
Humidity	• 20%~90% non-condensing
Housing	• 140mm) x 82(mm) x 35(mm)

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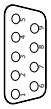
A.2. Software Specifications

Item	Specifications
Protocol	• TCP, UDP, ARP, ICMP, SNMP, HTTP, Telnet, BOOTP, ICMP, DHCP
Configuration	• Configuration information for both TCP/IP and serial ports is kept in the EEPROM. • Configuration utilities of Windows95/98/2000/NT/XP/2003 are provided for configuring settings. • Telnet, RS-232 console, web server configuration.
Internal Buffer Size	• TCP receiving buffer size = 8K bytes • TCP transmitting buffer size = 16K bytes • RS-232/RS-485 receiving buffer size = 4K bytes • RS-232/RS-485 transmitting buffer size = 4K bytes

A.3 Connector Pin Assignments

A.3.1 COM Port

9 pin D-type connector



COM ports may be either the RS-232 full duplex or the RS-485 2/4 wires.

Pin#	RS-232 Full Duplex	RS-485 2 wire, Half Duplex	RS-485 4 wire, Full Duplex
1	DCD	N/A	N/A
2	RXD	N/A	N/A
3	TXD	**DATA-**	**RXD-**
4	DTR	N/A (reserved)	**TXD-**
5	SG (Signal Ground)	SG (Signal Ground)	SG (Signal Ground)
6	DSR	N/A	N/A
7	RTS	N/A	N/A
8	CTS	**DATA+**	**RXD+**
9	RI	N/A(reserved for Atop devices)	**TXD+**

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A.4 Buzzer/LED Message

Buzzer

“ ^ “ : Beep twice

“ = “ : Beep off

Message	Description
^===^===^===^===^===^===^.. (1sec)	Watchdog problem, return service is required
^^^^^^^^^^^^^^^^^^^^^^..	Memory problem, return service is required
^==^========^^ (5sec)	Startup OK but AP firmware is disabled
^==^========^^^ (5sec)	Startup OK and AP firmware is enabled

LAN LED

Message	Description
LED Off	No data is transmitting on Ethernet
LED blinking	Data is transmitting on Ethernet

COM1 LED

Message	Description
LED off	No data is transmitting on COM1
LED on blinking state	Data is transmitting on COM1

COM2 LED

Message	Description
LED off	No data is transmitting on COM2
LED on blinking state	Data is transmitting on COM2

RUN LED

Message	Description
LED on	1.Jumper JP16 is opened to disable AP firmware in the flash memory. 2.Jumper JP16 is shorted, but no AP firmware in the flash memory.
LED blinking (rate: 0.5Sec)	AP firmware is running

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Appendix B. Upgrade System Software

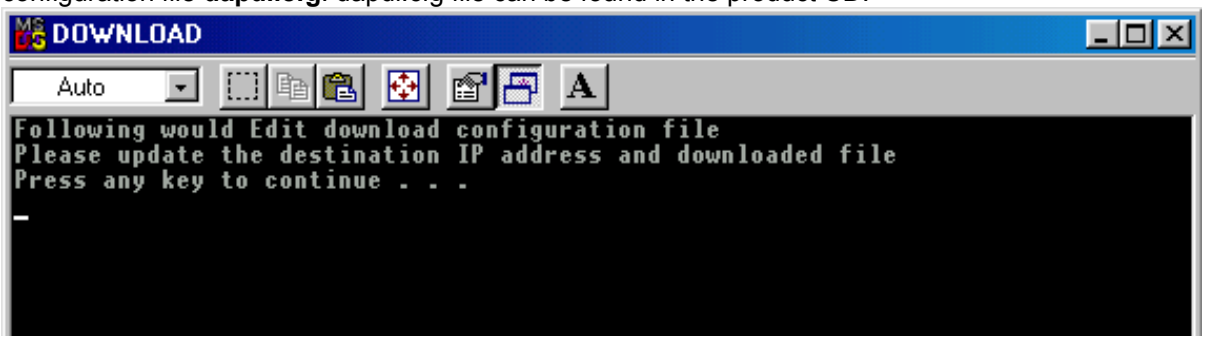
After the new version of firmware is released, customers can download it from Atop's web site at www.atop.com.tw. You can contact Atop's sales person to request the newest product CD as well.

You may decide to or not to upgrade the system's firmware. To do so, please follow these instructions listed below.

B.1 Upgrade Procedures

When you get a new software version, please follow the sequences below to upgrade your GW21W.

- Connect a PC (Windows 95/98/NT/2000) and GW21W you wish to upgrade the firmware in the same TCP/IP network. Use command **ping** or **monitor.exe** utility program to verify their availability.
- Prepare the download tool. Execute the utility program **download.bat** and press any key to edit its configuration file **dapdl.cfg**. dapdl.cfg file can be found in the product CD.


DOWNLOAD
Auto
Following would Edit download configuration file
Please update the destination IP address and downloaded file
Press any key to continue . . .

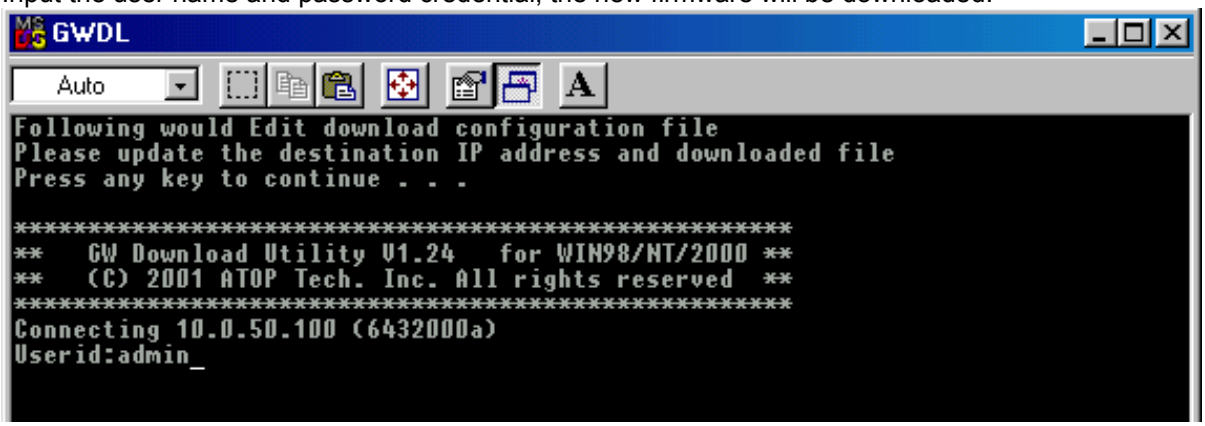
- Edit the **"dapdl.cfg"** file to fit your system need, the content of the file looks like as the following. Be sure to save your modifications after the change is made.

  Remote_IP 10.0.50.100

  Load U21wap.hex

  The first line identifies the IP address of GW21W, the second line identifies the firmware (.Hex file) name to be downloaded.

- Input the user name and password credential, the new firmware will be downloaded.


GWDL
Auto
Following would Edit download configuration file
Please update the destination IP address and downloaded file
Press any key to continue . . .
****
** GW Download Utility V1.24 for WIN98/NT/2000 **
** (C) 2001 ATOP Tech. Inc. All rights reserved **
****
Connecting 10.0.50.100 (6432000a)
Userid:admin_

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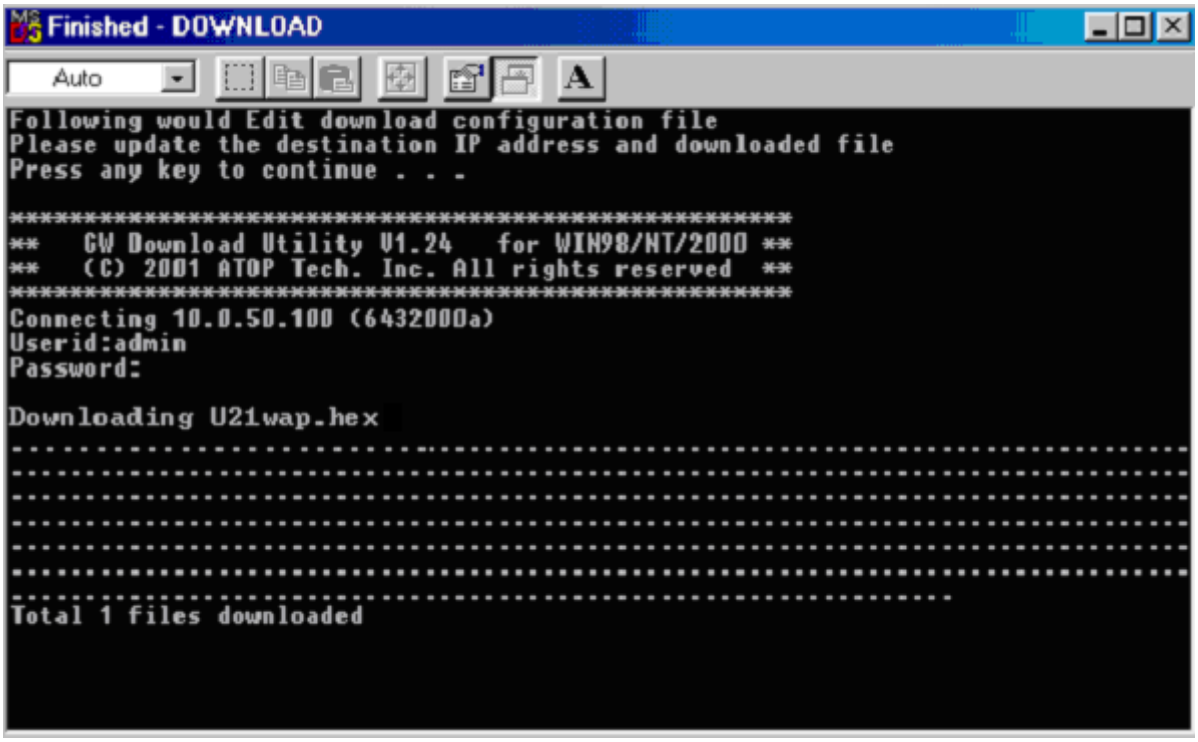
- GW21W will automatically restart each time the firmware is successfully downloaded.


Finished - DOWNLOAD
Auto
Following would Edit download configuration file
Please update the destination IP address and downloaded file
Press any key to continue . . .
** GW Download Utility V1.24 for WIN98/NT/2000 **
** (C) 2001 ATOP Tech. Inc. All rights reserved **
Connecting 10.0.50.100 (6432000a)
Userid:admin
Password:
Downloading U21wap.hex
Total 1 files downloaded

B.2 Critical Issues of Upgrading

1. You can always abort the upgrading process by pressing the **<Esc>** key from host PC during the upgrading process. The serial server will restart automatically and the system remains intact.
2. If GW21W does not receive any upgrade data within **30 seconds**, the serial server will restart automatically and the system remains intact.
3. After the upgrading process finishes, the serial server will program the flash memory and buzzer beeps 6 times then restarts. Normally, it takes around 10 seconds to complete the programming process. If an error occurs during the programming process,GW21W will clear the corresponding memory and the system remains intact of what it was.

B.3 Error Messages

Firmware upgrade may not be successful if errors occur during the process.

Error Cause	Message	Comments
Illegal Hex file format	Hex File Text Error Hex File Check-Sum Error Hex File Format Error Hex File End of Record Error	
GW21W handshaking problem	GW21W ACK Start Address Error GW21W ACK Length Error	

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	GW21W Response Command Error
Configuration file	Remote IP not found
	Open configuration file failure

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Appendix C. Hardware Configuration

C.1 Disable System Firmware

The AP (application program) firmware of GW21W can be disabled. This function is used in the situation that you downloaded a wrong version of firmware that caused the system crashed.

To disable the current version of firmware and prevent it from executing, please do the followings:

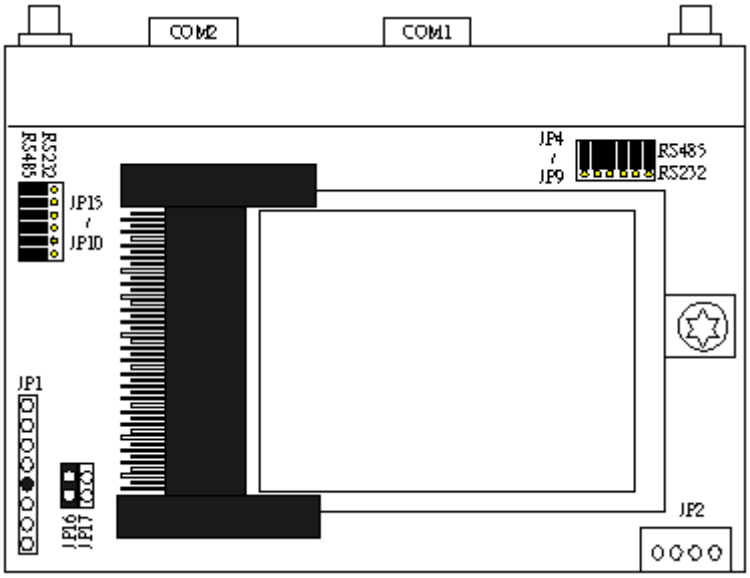
1. Turn off the power, open the case of GW21W.
2. Remove jumper JP16 from the main board to disable AP firmware.
3. Power on GW21W.
4. Download the correct AP firmware to GW21W.
5. Put the jumper JP16 back on to enable AP firmware.
6. Close the case and continue your operations.

Please refer to Figure C.1 Component Side of GW21W main board for jumper JP16 location.

C.2 Choose Type of COM Ports

GW21W (main board version 1.4) COM ports can be setup either RS-232 or RS-485 by hardware jumper.

1. Press two holes at lateral side to open the case of GW21W.
2. Set the Jumpers to RS-232 or RS-485.
   - Short all of the **upper** two pins of JP4~9 to set COM1 as RS-485, short all **lower** two pins of JP4~9 to set COM1 as RS-232.
   - Short all the **left** two pins of JP10~15 to set COM2 as RS-485, short all **right** two pins of JP10~15 to set COM2 as RS-232.
3. Close the case and continue your operation. To find the physical locations of these jumpers, please refer to below component side of GW21W main board v1.4.



Note: Monitor.exe utility can be used to demonstrate COM ports properties.

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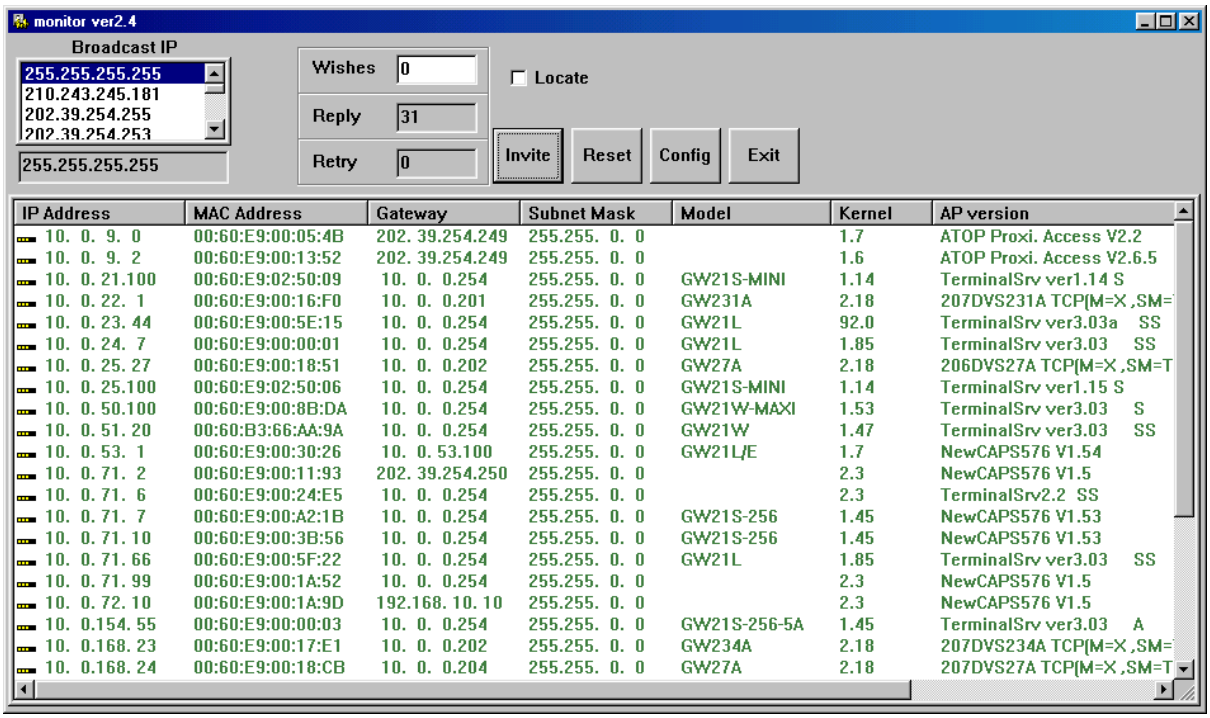
Appendix D Configuration Utility

The configuration utility **monitor.exe** comes with the product CD or diskette is the main utility program to demonstrate and configure GW21W's settings.

D.1 Run the utility

Start the program under Windows 95/98/NT/2000 environment and the following window appears.



D.2 Detect Operational Devices

You may do the following steps to detect devices currently available on the network.

1. Start **monitor.exe** utility program.
2. Select an item from the **Broadcast IP** list.
3. Specify a number in the **Wishes** box.
4. Click on the **Invite** button. This will display all the devices information you have requested.

D.3 Configure Devices

You may use **monitor.exe** configuration utility to configure the settings of devices on the network. To do so, please follow the steps below.

1. Repeat the steps in the section of **D.2** to bring up the devices information.
2. Select the device you want to configure from the **IP Address** column, click on the **Config** button, a configuration window will popup as shown in Figure D2:

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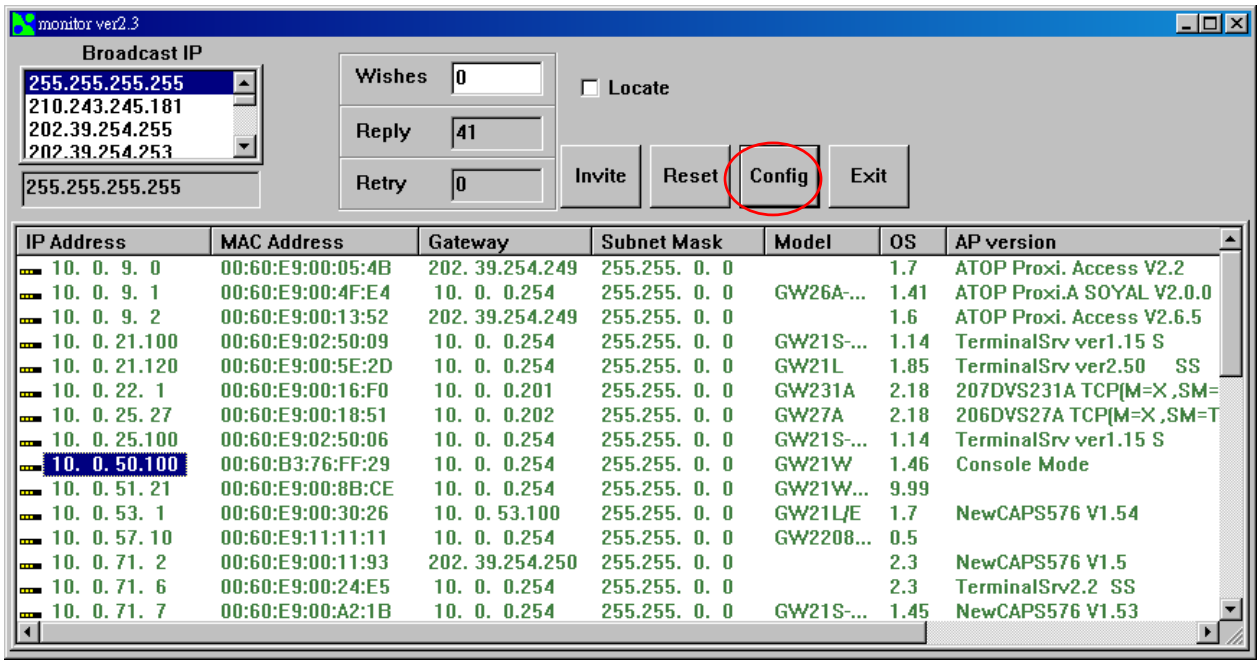

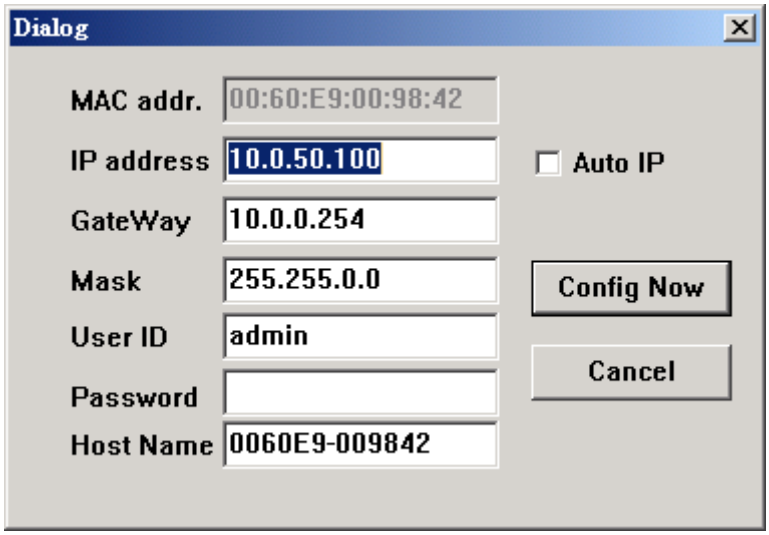

3. After you click the “Configure Now” button, the target device will return an ACK message indicating the modification is successful as shown in the following:

Please note **monitor.exe** version 2.4 and above requires **gw21le.dll** library to function properly.

The following table lists the functional descriptions for all the fields.

Field Name	Field Descriptions
Broadcast IP	Except for the default IP 255.255.255.255, other items (IPs) are read from the file “seg.cfg”. This field specifies a detecting IP range. It may be a designated IP or a broadcast IP.

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Wishes	Specifies minimum number of the devices you wish to get reply from after sending an **Invite** request. If there is not as many as devices responding to your invitation, the system repeatedly sends invitation until your request is fulfilled.
Reply	Indicates the actual number of devices this utility program detected.
Retry	Specify the number of times that an Invite request is re-sent.
Locate	Locate the specified device.
Reset	Reset the selected device.
Config	Configure the selected device.
Exit	Exit this utility.
IP Address	Indicate the IP address of the device that replied to your request. • Leading tag "!" stands for IP address collision, possibly caused by duplicated IP addresses on the network. • Leading tag "?" stands for Mac address collision, possibly caused by duplicated Mac addresses on the network.
MAC Address	Indicates the MAC address of responding device.
Gateway	Indicates the IP address of the gateway.
Subnet Mask	Indicates the TCP/IP network mask.
OS	Indicates the OS version of the responding device.
AP Version	Indicates the AP version of the responding device.
Model	Indicates the model number of the responding device. This field is only available for monitor.exe version 2.0 and above.

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